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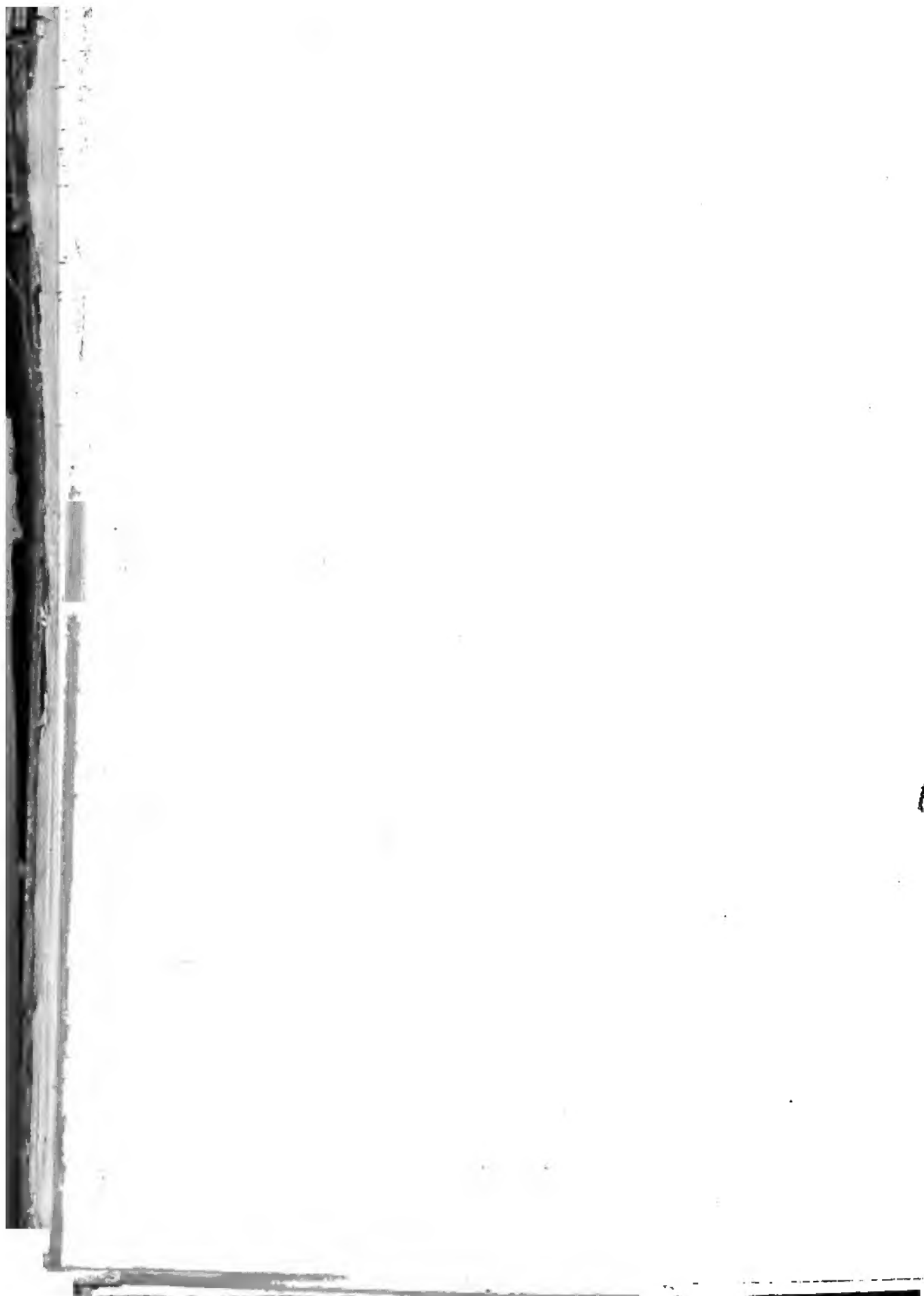
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THE
PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME

21

EDITED BY G. WHARTON SIMPSON, M.A., F.S.A.

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PREFACE.

SOMEWHAT less than twenty years ago was issued the first number of the PHOTOGRAPHIC NEWS, the first weekly journal devoted to photography. The step was at the time believed by many to be a hazardous adventure. Photography was supposed to be not sufficiently mature, photographers not sufficiently interested in photographic literature, to render such an enterprise successful. It is true that photographic journalism was then in its feeble infancy, and that since then many journals devoted to the art have been born, and are dead and forgotten ; but the PHOTOGRAPHIC NEWS having at once made good its claims to the suffrages of photographers, and supplied the wants it was bound to meet, has steadily gone forward, yearly acquiring a deeper and a firmer position in the regard and confidence, as well as in the number, of its friends and readers. In writing the Preface to its Twentieth Volume we look back on its progress, and regard its present healthy and stable position, with very profound thankfulness and satisfaction.

The aims with which we began remain the same, although much extended and developed in application. At the outset we announced our aim to be the guide and instructor of the beginner, the medium of communication and interchange of ideas between more advanced students, and the recorder of all improvements and discoveries which may take place in the art or in the allied sciences. This position, and something more, we believe we have succeeded in filling. We have, we believe, had the satisfaction of initiating and stimulating, as well as chronicling, progress. We have endeavoured to aid the research of the investigator, as well as to record its results ; to enforce art-culture

amongst photographers, as well as afford materials in aid of such culture ; to uphold the scientific status ; and to consider and maintain its interest, and those of its votaries, whether regarded as an art, a science, or an industry. The task of watching the progress, in its every phase, of the art throughout the world, and publishing a sufficient record ; of gathering, weighing, selecting, estimating and rejecting, discussing, condemning, approving, and preserving the facts, suggestions, modifications, and improvements which present themselves from time to time for consideration, is not a light one ; but we are sustained in it by the hearty co-operation of many hundreds of correspondents and contributors, and by the confidence and approval we have had in the past from thousands of readers. We have nothing to add beyond saying that we shall not willingly fall short of the past. We will walk by the same rule, and mind the same things ; and in all respects make our journal worthy at once of the confidence and of the aid it has hitherto so bountifully received.

Thanking the large circle of contributors, correspondents, and readers we have met in our pages in the past, and hoping to meet them not less satisfactorily in the future, we conclude by wishing every one of them a successful and happy New Year.

January, 1877.

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The Photographic News, January 5, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE PHOTOGRAPHIC NATIONAL GALLERY AGAIN.

A month or two back we had a say about portraits in oil and portraits by sun-painting, and pointed out that the general run of portraits exhibited at the Royal Academy, and in similar collections, were by no means remarkable for very high art, and that first-class photographers light and pose their sitters with as much taste as *savoir faire*. If our best photographers have sometimes failed to make the progress that might be expected from them after many years' study and training, it is due, we think, to the circumstance that they are taking up with the most difficult branch of the art.

A painter is often able to secure a likeness of an individual, but fails, nevertheless, in producing an artistic picture, while there are others, again, of whose work one says, "It is very nice and very pretty, but it is not a bit like you." We ask any impartial critic to look through a collection of portrait-pictures by Adam Salomon, Beijlander, Loescher, Petach, Fritz Luckardt, or Bergamasco, to name promiscuously the work of five good photographers in five capitals of Europe, and to compare these with the oil portraits by artists in the same cities, and we will undertake to say that not only in respect to fidelity, but pose and artistic excellence, the photographers will not fall much short, if they do at all, of the paintings. We will say more: that the leading photographers of London and other large capitals render a man or woman more truthfully than do second-class portrait painters in the same cities. We are not talking of "New Road photography" any more than of the daubers of signboards; but we are asserting that the best photographers in the kingdom (whose number, we admit, could very well be reckoned on the fingers) do quite as good portrait-work as the majority of those painters who show portrait work in the Academy.

It may be said that portraiture is just the weak point of our painters, and no doubt this is so. Portrait-painting, as we have said, is a very difficult art, but for that very reason we hold it to be exceedingly creditable on the part of our best photographers that they have succeeded so well in overcoming the many difficulties met with. And now that photographers have succeeded in the art of producing good and, in some cases, very excellent portrait pictures, we wish to call attention once more to a project which has already been debated in these columns—it is that of a Photographic National Gallery. We have photographers now who are artists, and we have a method, too, of producing permanent pictures. Mr. McLachlan, of Manchester, and Mr. Baden-Pritchard, of Woolwich, have been especially prominent in urging such a scheme upon the attention of the public, the latter, we believe, putting forth a practical plan for the formation of such a collection, at a lecture delivered by him seven or eight years ago at the Royal United Service Institution.

The carbon process and collotype methods have so much improved of late that the production of portraits of this kind—as permanent in their nature as oil paintings—would exhibit no difficulty at all. The chief objection, so far as we have heard, is not the fear of producing prints that were not permanent, so much as to get good portraits that are pictures at the same time. Indeed, we have heard men hostile to photography, and all things photographic, fervently remark that if such a gallery ever comes to be established, a fleeting and not a permanent printing method should be chosen, for the very reason that all the "atrocity" would perish sooner or later. Such people's idea of

photographic portraits has been ignored by placing out the enormous collection of portraits that are to be seen in many homes in which photography of every age and every quality is represented. A family album that contains portraits of friends, deceased, perhaps, twenty years ago; or pictures that have been taken by the village photographer when *cartes-de-visite* first came into being, are scarcely likely to present prints of a first-rate order, and their inferior aspect is still further increased by being in juxtaposition with other portraits taken but the other day by a Robinson or a Blanchard. Such albums as these never fairly represent the art of photography, but as, unfortunately, they exist in many households, they always have a tendency to prevent the new art from advancing beyond a certain sphere.

In the case of a collection of celebrities, men and women who have made their mark in the world, the photographers who would be entrusted with the duty of securing portraits would, as a matter of course, be experienced both in the art and technicality of the process. There would be no fear that a collection of oddities would be formed, while the adoption of a uniform and quiet style would impart an unobtrusiveness and modesty to the pictures which perhaps all photographic portraits should possess. If the pictures were well and carefully executed, of a size not so small as to require close examination to observe features, we feel sure that a Photographic National Gallery would attain to considerable importance, and be studied by everybody with interest. There is only one body in London which, to our knowledge, has gone systematically into the matter of forming a gallery of this kind. Many clubs and societies own an album with portraits of members, but these collections have many of the faults of the family volumes to which we have just alluded. But the Whitefriars' Club, in Ludgate Circus, which numbers many men well known in literature and the drama among its members, is in the possession of a large series of portraits executed by Mr. Valentine Blanchard, which, while of some considerable artistic merit, are of such dimensions (15 inches by 13 inches) as to be both handsome and well proportioned for hanging purposes. That such a scheme as we mention will one of these days come into being, is a matter on which no doubt can be felt, and the only question really is how long it will be delayed. Every year that passes loses to us some face we should delight to cherish, for negatives taken years ago get mislaid or broken, and are then beyond our power. At Munich there is a very fine gallery, representing, as well as it can, the history of painting, and in the antechamber are half-a-dozen portraits of the founders of the gallery. Were we so minded as to collect the portraits of the founders of photography, we should have some difficulty even now. Of Nicéphore Niépce, the first practical camera photographer, there is, we believe, no portrait extant, and of M. Daguerre but very few pictures are now to be found; Mr. Alderman Mayall, of Brighton, being, we think, the only English possessor of a negative of that talented inventor. Fox Talbot, we are glad to say, we have still with us, and it is our fervent hope that this father of photography in Great Britain may be spared us for a long time to come. Then there are such men as the Duke of Wellington, of whom it is very possible there may be a Daguerreotype of some sort in existence; and literary men like Macaulay, Thackeray, Hallam, &c., whose images we would not willingly let fade away. Oil paintings in plenty we have of these distinguished individuals, but who, one hundred years hence, would care to see a painted portrait of the victor of Waterloo, if they could gaze upon a veritable shadow of the great man, that has been caught up and fixed for ever? Sooner or later, we say, a Photographic National Gallery must be formed, and as our photographers are now something of artists, and we can produce pictures in permanent pigments, there can be nothing gained by postponing the establishment of such a gallery any longer.

FRENCH CORRESPONDENCE.

BOIVIN'S DRY COLLODION PROCESS—MODIFIED SILVER BATH AND DEVELOPER—DRY PLATES AS SENSITIVE AS WET—A PARIS STUDIO WITH VIOLET LIGHT—COMPARATIVE EXPERIMENTS BETWEEN ORDINARY LIGHT AND VIOLET RAYS—EXTRAORDINARY REDUCTION IN TIME OF EXPOSURE.

M. BOIVIN, of Mans, to whom we already owe several interesting communications upon the subject of dry collodion, has communicated to me the details of a process by means of which he obtains plates as sensitive as those secured by the wet process. He begins by well cleaning his plates in potash or soda solution, he washes them in ordinary water, and, finally, covers them by means of a rag with a thick mixture of chalk and water. According to his notion, success depends, in the case of dry plates, in cleaning the glass with an *alkaline* substance, while the employment of an acid under such circumstances is, on the contrary, indispensable in the preparation of wet plates. When the glass plates are to be used the white that covers them is removed with a bit of flannel, and, finally, a camel's hair brush is passed over the surface. The plates are then covered with a solution made up as follows:—

Albumen	...	...	30 cub. cents.
Water	...	...	70 "
Ammonia	...	...	1 to 2 "

The mixture is beaten to a snow, allowed to stand a while and is then filtered, after which it is applied to the plates. When the plates albumenized in this way have been well desiccated they are put away into a plate box. They are collodionized with old collodion, or, at any rate, with a mixture of old and new in the proportion of one-third of the former to two thirds of the latter. The sensitizing of the film is undertaken in a bath of—

Nitrate of silver	...	...	8 grammes
Acetate of lead	...	...	1 gramme
Water	...	...	100 cub. cents.
Acetic acid	...	...	a few drops

M. Boivin recommends that the silver bath should be exposed for a long time to full daylight, and then filtered; in this way he asserts that fogging is avoided, a defect so often observed upon dry films during the development of the same.

The plates remain in the sensitizing bath for the space of three minutes, and then they are washed first of all in water slightly acidified with acetic acid, and further with pure rain water. Then there is poured successively over the surface a solution of phosphate of soda of three per cent. strength, and another of gallic acid of one per cent., and, without washing, a preservative varnish composed of—

Water	...	...	100 cub. cents.
Pure dextrine	...	...	9 grammes
Gum arabic	...	...	1 gramme

The gum and dextrine are dissolved in warm water, to which is added a few drops of acetic acid; the solution is filtered before use.

Plates prepared in this manner are put into a drying cupboard so that they may be dried uniformly and thoroughly, and will then be found to retain their sensitive qualities for a fortnight at least. The flask containing the preservative varnish must be put away in a cool, fresh place, where the temperature is a regular one; under these circumstances it may be kept a long time without becoming turbid or decomposed.

The time of exposure in the case of plates of this kind varies, of course, with the nature of the lens employed. With a landscape lens of quarter-plate size, and a diaphragm of a centimetre opening, ten seconds to a minute will suffice for the production of a cliché.

To develop the image it is necessary, first of all, to

plunge the plate into pure water, and then into a tepid water bath; afterwards the plate is immersed in:

Water	...	...	250 cub. cents.
Gallic acid	...	...	1 gramme
Pyrogallic acid	...	...	0.3 "
Acetic acid	...	...	3 cub. cents.
Alcohol	...	...	3 "

Before immersing the film, there is added to the bath a few drops of a solution of phosphate of soda (3 per cent. strength) and a few drops of acetate of lead of the same strength, together with a few drops of acetic acid. When the plate has remained some minutes in the bath, it is taken out again, and a trace of a 3 per cent. solution of silver is added. The cliché plunged a second time into this energetic reducing agent soon becomes developed in all its details; further, silver may be added, should it be deemed desirable.

The process of intensifying is carried on as usual, and the image is finally fixed by a 20 per cent. hyposulphite solution.

M. Boivin thus sets out the theory of this process. The albumen is employed not only to give adhesion to the collodion, but more especially to endow the sensitive film with an organic substance susceptible of absorbing iodine, which is set free by the action of light. The acetate of lead in the silver bath acts in the same way as acetic acid, namely, to prevent the plates from fogging, but with this difference, that there is no retarding action.

The influence of light upon the sensitizing bath is made manifest by the reduction of organic matter, which, afterwards separated by filtration, is no longer the cause of frequent fogging, so rife among dry plates.

The phosphate of soda employed after sensitizing is used for the purpose of transforming the last traces of nitrate of silver that remain after washing into phosphate of silver, which is very sensitive to light. These traces, if permitted to remain in the form of nitrate, promptly change the impressed film. Gallic acid possesses the double property of acting as a sensitizer, and as a preserver of sensitiveness.

Not only does the preservative varnish protect the iodide of silver from contact with the air, but, like the albumen, it absorbs the iodine that is set free during the exposure of the plate in the camera; it also prevents all molecular change in the film when drying. The least washing, especially with warm water, suffices to remove the varnish, so that the reducing agent when applied at once acts upon the latent image.

The addition of phosphate of soda and acetate of lead to the reducing or developing agent augments the energy of the latter very considerably, and permits the securing of clichés of a brownish-green tone which yield very vigorous prints.

Although it is perhaps a little too early to speak of the matter, the new system of lighting with violet light, suggested by M. Scotellari, seems to gain a great many disciples. M. Scotellari has arranged, at the establishment of MM. Gilles Frères, a studio based upon his principles, from which the incredulous make their exit as converts. We ourselves assisted the other day at one of the experiments, and we were at once struck by the change that comes over the face; it is indeed a transformation that comes over every one who penetrates this violet atelier. The violet tint lends to one's physiognomy a strange charm, and one may almost say that the most ugly sinner changes at once, and assumes a beauty which he did not possess until illuminated by this harmonious light.

The experiment was as follows:—A collodionized plate was exposed to the extent of one-half upon a sitter lit up by ordinary light in one part of the studio, an exposure of sixty seconds being given; then upon the second half of the collodionized plate, after the sitter had been placed where he was illuminated by violet light, was t

a second image, but this time with an exposure of twenty seconds only. In developing, the plate was treated as if it had received but one exposure, and two images were developed, both having the same amount of vigour; in the end it was found that while in the second case, with the use of violet light, nothing had been lost by shortening the exposure, the peculiar mode of illumination had added to the detail of the picture.

From this experiment it will be seen that with an exposure of twenty seconds in violet light, it is possible to obtain the same result which, under ordinary circumstances, requires a period of sixty seconds. We shall take the liberty of returning to this subject on the occasion of other comparative experiments at which we have promised to assist.

ERNEST LACAN.

THAT DOG.

BY NORMAN MAY.

ABOUT three o'clock one afternoon, a week or two ago, an elderly lady brought an immensely fat, shaggy dog to be photographed. I took her word for its being a dog, otherwise I might have taken it for a buffalo or a bear. I explained that the day was dull, and being December it was rather late to take a dog, and wished her to bring it in the morning. Then she began, "Oh! no; I'm sure he'll be good, and the light doesn't make any difference for a dog; there's no modelling of the face, no delicate gradations of light wanted, don't you see?" I didn't quite see, though I said nothing, but thought I should like to see the photographer that could get any delicate gradations out of that dog. "You know, he's the son of a celebrated dog, and his grandfather belonged to the Prince of Wales. We call him Julius Cæsar." I didn't feel particularly interested in his ancestors, but felt sorry his grandfather arrived at years of maturity. I said I'd try a plate as she was going away to-morrow, and couldn't possibly come again, so they were ushered into the studio. When the dark room assistant heard the footsteps and creaking floor, he took one hurried glance at the huge beast, and bolted himself in the dark room, only emerging on my assuring him that it wasn't one of the animals escaped from a menagerie then in town.

The dog was quiet and docile enough, and when his mistress began again to tell me, "You know his name is Julius Cæsar, and his grandfather belonged to the Prince of Wales," &c., he laid his head down and went to sleep. He was evidently used to those words. She wanted him in a standing position, to "show his figure," as she said. I thought that if there were any figure in an old bull-frog swelled up by eating dried apples, that the dog would be just the correct thing. Just then the assistant came out with the plate, on which we could take three carte-pictures. We commenced to pose him, and, as we didn't keep a portable crane in the establishment, we had to raise him by our united efforts. We succeeded, though I've had a lame back ever since. The lady said she'd sit on one side of the studio and talk to him, as she wanted him profile in one, and she commenced to tell me of the profile of his grandfather, who belonged to the Prince of Wales, &c. He then went to sleep again. We lifted him up, and got him so as to show his profile. Just as I was about to expose, the lady requested me to wait a minute, as the expression wasn't quite right; and she began to tell me of the expression of his grandfather, who belonged to the Prince of Wales, &c. I smiled a sickly smile, and the dog slipped under the table. We hauled him up again, and this time I managed to get the cap off, and everything went on smoothly for about two seconds, when the lady began to speak again, and the dog, fancying she was saying something concerning his grandfather and the Prince of Wales, curled himself up and went to sleep.

I didn't blame the dog, but smiled a still sicker smile, and got ready for the next exposure. This time the lady thought a biscuit would be sure to attract him, as he was such a pet dog, as his grandfather was of the Prince of

Wales, &c. We got him standing again, looking as sober and elegant as a cow on ice. He seemed quite steady, and I exposed. I hadn't exposed more than three seconds before the lady said, "Biscuit! won't Julius Cæsar have a biscuit?" Julius thought he would, and walked over to get it. Of course, that one was spoiled; and then for the last space on the plate. Next time he was posed nicely, and the expression pronounced quite benevolent, so under favourable circumstances I began. Just then Julius Cæsar wagged his tail, upsetting a table behind him, and smashing a vase and things. The lady said she was so glad it didn't fall on him, as he might have been hurt.

I sent that plate into the dark room, and while the assistant got another ready, I went and made out the bill for damages. I mildly insisted on trying to get him still myself next time, and she must try and put up with a full-face view of him.

She seemed in deep distress at that, as she said the Prince of Wales had such a nice photograph of his grandfather taken profile.

I began to feel still more sorrowful about his grandfather, and dropped a silent tear of perspiration, but went on with my focussing. Next time I managed him nicely for about ten seconds, when the lady began again to tell me of Julius Cæsar's grandfather, &c. That seemed to be a sort of evening prayer for the dog, and he lay down and went to sleep. My patience was getting exhausted, and somehow I got a little tired of hearing of his grandfather, so I asked her if she'd mind going into the other room. I promised her I wouldn't take him till I was sure he had a pleasant expression, so she went, at which I was glad, as I could hear the assistant indulging in some ornamental language in the dark room, but he is a married man, so I excused him. The last two exposures I managed to get on pretty well with, and it was too late to take another, at any rate, so I gave Julius Cæsar to understand it was all over, and at parting kicked him gently for his mother. I told the lady I thought I had succeeded in getting a tolerable one, and was much pleased to hear her say, "If I didn't think it was good, she thought she could come in the morning, as she wanted a good one." As I hadn't a day to spare, I said it would do very nicely, and she went, after giving me full particulars concerning Julius Cæsar's grandfather, &c. We printed some off, and it was a very fair likeness of the beast. You could see which was the right side up by the carpet, and you could make sure it wasn't a giraffe, though that was about all. It's unnecessary to add that it didn't come in again; and I think if I had to choose between photographing two babies during an earthquake, or that dog, I'd take my chances on the earthquake.

PRINTING-IN BACKGROUNDS.

BY DR. LIESEGANG.*

It not unfrequently happens that the photographer desires to print a portrait with a different background, or to give a landscape a cloud-sky, or to impart to some picture a sort of framework which may have been secured upon another negative.

In the first case, the photographer desires to substitute, probably, a more even background for the defective one of the portrait-cliché itself. The ordinary way of cutting out a shape in paper to cover the background, and attaching it to the negative when printing, yields such a hard outline round the figure that now-a-days, when there is little retouching done, it can no longer be used. The following process, on the other hand, gives a very soft outline, as beautiful, indeed, as that of the original negative:—

Upon the collodion side of the negative is laid a piece of yellow paper, and upon the latter is traced, by the aid of a pencil, an outline of the figure, holding up both against

* Photographisches Archiv.

the light in order to do so. With a sharp penknife the figure is then cut out of the yellow paper, the same being put upon a plate of glass to facilitate the operation. The outer portion, which represents the background, is then attached, by means of gum, to the reverse side of the negative. When necessary, a little modification of the mask may be managed with a brush and some cianabar, the pigment being also applied on the glass side of the negative. On the collodion side of the negative, the outline may also be further softened with a stump and graphite.

From this negative a print is now obtained, the portrait having, of course, a white background. If the background is to be shaded or vignettied, there is placed upon the printing frame a vignette mask, or a piece of wood with an oval opening, the under edges of which are bevelled, this latter being placed about an inch or an inch and a half from the glass plate.

The print upon a white ground is laid, picture-side uppermost, upon a strong piece of patent plate-glass; upon it is put an oval or angular mask of black paper, and upon this the negative of the background to be printed in, whatever it may be, landscape, interior, stippled plate, &c., the collodion surface being underneath. Upon the glass of this negative you trace an outline of the portrait, making a line inside the figure with a brush dipped in a mixture of red oil colour and olive oil; the cut-out paper figure is then pressed down upon the glass, so as to print off upon it the red outline. With a pair of scissors the paper figure is trimmed to the red mark upon it, the glass is freed from the colour with a rag, and a second time an outline is painted with the brush more accurately than before, so that the line goes inwards over the figure. The properly cut paper figure is laid upon this outline, and over the whole is placed a thin glass plate, upon which some more red colour is applied on the border of the mask, so that no direct rays can fall upon the join underneath.

When the picture, with the vignette upon a white ground, has been printed, it is necessary, in order that the lower part should be gradually shaded, to apply some of the red colour, which is so rubbed and disseminated that the light is more or less screened off, and no sharp outlines are produced. The whole is covered with a heavy glass plate, and placed upon a movable table to print. The table is shifted from time to time to prevent the light from always acting from the same direction. As it is now impossible to get a peep at the print to see how it is getting on, it is necessary to have recourse to a photometer.

When the background has been printed in this way, the negative is taken away, and upon the print, still lying on the glass plate, is put a sheet of very thin, clear glass. Upon the latter the red colour is again applied upon the outlines of all portions which are to remain light, such as hands, face, linen, &c., and an impression of these red lines having been made upon yellow paper, masks of the latter are cut out and placed over the parts to be covered.

Upon this is laid a somewhat thicker glass, upon which the outlines of the covered parts are exactly followed with red colour. High lights, that are to be kept clear, are also covered with a few lines of red colour. The print is then exposed to the light again for a very short time, and, if necessary, shaded the while by some mechanical arrangement.

Upon the white margin, which has remained covered by the mask around the picture, may now be printed a grey tone, or some sort of fancy border. An inner mask cutting in, with this view, laid upon the print, which is something smaller than the mask, and upon it is put a glass plate or a negative, with the requisite design upon it. After this final printing the print is toned and fixed.

When the negative is hard, a better effect may be secured by printing the picture first of all to only three-fourths the proper intensity, and inserting a very thin sheet of

glass carefully between negative and paper, and completing the process of printing.

From this description many may think the process very tedious and complicated. In practice, however, it is very simple, and when some little practice has been attained in the matter, printing in this way goes on very rapidly.

NOTE ON THE PHOTOGRAPHIC SPECTRA OF STARS.

BY WILLIAM HUGGINS, D.C.L., LL.D., F.R.S.*

In the year 1863 Dr. Miller and myself obtained the photograph of the spectrum of Sirius.

"On January 27th, 1863, and on March 3rd of the same year, when the spectrum of this star (Sirius) was caused to fall upon a sensitive collodion surface, an intense spectrum of the more refrangible part was obtained. From want of accurate adjustment of the focus, or from the motion of the star not being exactly compensated by the clock movement; or from atmospheric tremor, the spectrum, though tolerably defined at the edges, presented no indications of lines. Our other investigations have hitherto prevented us from continuing these experiments further; but we have not abandoned our intention of pursuing them."†

I have recently resumed these experiments by the aid of the 18-inch speculum belonging to the Royal Society's telescope in my possession. Considerable delay has arisen from the necessity, for these observations, of a more uniform motion of the driving clock. For this purpose Mr. Howard Grubb has successfully applied to the clock the control of a seconds' pendulum in electric connection with a sidereal clock. This system works quite satisfactorily.

The prisms employed are made of Iceland spar, and the lenses of quartz. After an extensive trial of different photographic processes, preference has been given to dry plates.

The apparatus is so arranged that a solar or electric spectrum can be taken on the same plate, for the purpose of comparison, with the spectrum of the star. Spectra have been obtained of Sirius, Vega, Venus, the moon, &c.

I do not purpose in this preliminary notice to describe in detail the arrangements of the special apparatus which has been constructed, nor to offer in their present incomplete state to the Royal Society the results of the experiments. Still I venture to hope that even in this early stage of the inquiry the enlarged copy of the spectrum of Vega (α Lyræ) which accompanies this note, may not be regarded as altogether unworthy of attention.

After exposure to the light of Vega the dry plate was allowed to remain in the instrument until the following morning, when a solar spectrum was taken upon it through the half of the slit which had remained closed when the instrument was directed to the star.

The photograph shows seven strong lines, all of them slightly shaded at the sides. The two lines which are least refrangible coincide with two known lines of hydrogen in the solar spectrum.

It is expected, by means of an apparatus now in the course of construction, to obtain also any finer line which may be present in the spectrum of this star, as well as to extend the photographic method to stars which are less bright.

I need not now refer to the many important questions in connection with which photographic observations of stars may be of value.

PORTRAIT PAINTING UNDER DIFFICULTIES.

Don Maan stops me in the street one day, and with a disturbed countenance tells me that his only child—a girl of three—has been lately buried. Will I or my partner be

* Read before the Royal Society.

† Phil. Trans. 1864, p. 420.

so good as to restore her to life on canvas? I agree to undertake the work if Don Magin will provide me with a guide in the shape of a photograph.

"I am sorry to inform you," says the Don, "that my poor child never sat for her photograph."

"Then," I remark, "I will be satisfied with a slight but faithful sketch, or even a coloured miniature."

"I regret that I cannot supply you with any representation of my departed daughter," replies Don Magin.

"How, then, can you expect to possess a portrait of her?" I inquire.

"Easily enough," he answers. "It is true that I have no actual likeness of the child, but equally good guides are at your disposal. I can provide you with the little dress, the little hat, the little shoes and socks which she was accustomed to wear. I have also taken the measure of her height, and the size round her pretty waist. I can furnish you with minute particulars respecting the colour of her complexion, hair, and eyes, and I will show you a lovely child who resembles my own in many ways. Besides this, my Engracia was considered to bear a strong likeness to her father. Make her appear so also in the painting; introduce the accessories I have mentioned; take a notion or two from the girl that I will send, and I am convinced that the result will be satisfactory to both of us."

In vain do I endeavour to show the impossibility of such an achievement; the merchant will not hear of refusal, and as an inducement for me to make only a trial, he offers me a large price, promising to double the amount if I succeed to his liking.

It is a source of infinite consolation to the distressed old gentleman—who by the way is very grey and wrinkled—when I finally agree to make a trial; but I warn him that his anticipations about the result will never be realized.

Sanguine and happy, my strange patron departs, and in due course I receive the various articles he had specified. The pretty child serves well enough as a model for the proportions of the figure, and attired in the garb of her late lamented playmate, she enables me to devote every attention to the detail. I am also able to crown the little pink dress with an infantile face, whose hair, eyes, and complexion I colour according to instructions; and with the introduction of a landscape background, and with a stray flower or two arranged in the foreground, the sum-total is a pretty picture which, on that account, leaves at least a "balance in my favour!"

The portrait (?) having been placed in its gilded frame, my patron is invited to inspect it.

For many long moments Don Magin contemplates the work without uttering a word. His countenance, which I watch with an anxious eye, as yet expresses neither approval nor the reverse.

Does this portrait on my easel remind the bereaved parent of his lost offspring?

It does! yes; there faithfully depicted are the very dress, the very little hat, and the still smaller shoes which she was wont to wear in life! The figure, complexion, colour of eyes and hair, are all here to a shade. In short, a resemblance to his child gradually develops itself before the old gentleman's vision, till at last clasping both my hands, and with tears in his eyes, he declares that I have succeeded far beyond his best expectations.—*"The Pearl of the Antilles," by Walter Goodman.*

MICRO-PHOTOGRAPHY FOR GENERAL USE.

BY E. MACH.*

ABOUT seventeen years ago, when a student, I communicated to M. Auber—then director of the State Paper Office at Vienna—a proposition in regard to micro-photography, which was afterwards rejected as impracticable. I had never given the matter another thought, until a little while ago

an engineer (M. J. Popper) showed me a tiny micro-photographic newspaper which had been reduced to these dimensions in order to be forwarded to Paris when that capital was besieged in 1870-71. My scheme then again occurred to me, and as it does not even now, after all this lapse of years, appear valueless, I will here endeavour to place in writing what my object is.

I propose that micro-photography—which has hitherto only been employed for pastime and for knicknacks—should be systematically developed and employed for useful purposes.

There are a large number of very costly and very rare works in this world, of which a re-issue will never be made from the printing press, and which may be deemed works of reference rather than books for reading. How cheaply might these be multiplied, and made accessible to all in the same way as the newspaper above referred to! From the circumstance that a very large number of sheets could be photographed together, and could be reproduced within a very limited area, the process of doing so would be a very inexpensive one. Most important literary works might be in this wise furnished in a most convenient and portable form. Who would not wish to possess a map of his own country or of Europe in the smallest form, furnished with all the details of an ordnance map?

Tables of various sciences, if reproduced in the same manner, would hardly be less valuable. All reference works and books, dictionaries, encyclopædies, and the like could be treated in such a way. Even when whole works have to be reproduced, micro-photography would be a cheap way of doing it.

One main difficulty in carrying out such a project would be, doubtless, the operation of finding out the places in reading, and, in short, in the utilization of such tiny documents. The finding would have to be managed by prominent marks and signs placed on the margin, so that these would form a sort of table of contents, and instead of adopting a book form, it would be more convenient, no doubt, to have the copies in one continuous roll.

As regards the consultation or reading of such documents, I cannot, as a physicist, see that there would be any difficulty in constructing an apparatus with a double magnifier for both eyes, by the aid of which the student could read the matter as comfortably as if the type were larger. A double lens of this kind, and a means for moving the roll sideways or lengthways, would constitute the whole of the apparatus required.

Micro-photography will not, of course, supersede ordinary printing, any more than the railway has rendered driving, riding, and walking superfluous. In the way I have mentioned, however, I cannot help thinking that it could be employed with very great advantage, and would be a much greater aid to literary investigation than the ordinary type, as this is compared to manuscript.

I cannot but think that, whatever may be said to the contrary, there are very great difficulties in the way of carrying out this project; nor can it be considered a far-fetched one, since it is a plan that I myself have been urged to adopt to meet my own wants. When compelled to work far from home, and can only carry about with me a limited number of works of reference that are indispensable to my work, I have found micro-photography assist me very materially in my labours.

PHOTOGRAPHIC TEST PATTERNS.—The Landore Steel Company, the *English Mechanic* says, use photography to illustrate the character of the metal manufactured by them. A plate of wrought iron is placed on a hollow anvil, and a small gun-cotton cartridge is exploded on its upper surface, the result being an indentation and fissures all over the surface. A plate of steel is treated in a similar manner, and when photographs are taken of the two plates the quality of the two metals can be estimated by purchasers in all parts of the world as easily as if they had witnessed the experiments.

* *Photographische Correspondenz.*

The Photographic News.

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PHOTOGRAPHY IN THE PAST YEAR.

THE year 1876 can scarcely be regarded as having been a favourable year for photography. Throughout the year the weather has been unfavourable, and a glance at the commercial barometer suggests that considerable depression has attended photography as a profession and an industry. Nevertheless, it has been a year of intellectual and experimental activity, and the twelve months' history of photography as an art-science has not been without interest. There is little, however, in the way of absolute novelty or of discovery to record; but modifications, improvements, and better knowledge of existing processes, all of which form part of the steady current of progress, have not been wanting.

The wet collodion process, which still remains the accepted basis of practical photography, has not undergone any change during the year: collodion, nitrate bath, and developers remaining, as they have done for years past, practically the same thing. In this country few photographers prepare their own collodion, and hence little is done, or, at least, recorded, in the way of experiment. Existing manufacturers have brought their products to a high state of excellence, and, what is of equal importance, to an admirable uniformity of excellence. The possession of samples from two or three of the standard makers, to mix in varying proportions, and so combine their special qualities for various kinds of work, gives the practical photographer a wide and varied range of excellence, which is exceedingly convenient. The nitrate bath still continues a constant source of trouble to the inexperienced, and no specific cure for its manifold infirmities has yet been found. The selection of pure nitrate of silver and pure water, and the use of a large quantity of solution, seldom filtered and never doctored, are found, as a rule, the chief necessary elements in securing a good bath. But, in spite of all ordinary care, at times troubles come: fog, thin images, over density, matt silver stains, streaks, and pinholes. The remedies are, however, for the most part well known, simple, and efficient. No new remedies have been proposed during the year; but the use of nitrate of baryta, at the rate of three grains to the ounce of solution, for the removal of pinholes, has been further tried, and, in many cases, approved as successful during the year. The precise mode of its operation remains uncertain. Developing methods remain the same. The ordinary iron developer, in use for many years past, is still in use. Mr. Lea has suggested a new preparation of collocine for addition to the iron solution, as a means of securing vigour without prolonged exposure, which has received approval from many who have tried it. Messrs. Eder and Toth have experimented largely with the use of lead salts in conjunction with the iron developer, as an aid to intensification. Our last volume

contains details of their operations in a series of articles which will well repay perusal.

Dry processes have continued to occupy much attention. Emulsion processes have progressed in general estimation, and modifications in their preparation are still the subject of discussion amongst experimentalists; but, as in the case of collodion for the wet process, there is a tendency to permit the manufacture of the sensitive emulsions drift into commercial, and therefore experienced hands, whereby many difficulties and disappointments are avoided. A degree of rapidity not inferior to that obtained in the wet process seems, in many cases, to be attainable in dry processes. With very rapid plates, of course, greater care is required, and greater risks are involved; but we have seen during the year examples of very great rapidity in all the commercial dry plates which have come under our notice—the rapid bromide plates of Rouch, the rapid emulsion plates of the Liverpool Company, and the urano emulsion plates. The results of Herr Warnerke's sensitive pellicles are very fine, and are, we understand, rapidly produced. In point of sensitiveness, as well as excellence, Mr. Kennett's gelatine plates seem to leave little to be desired. Amongst the older dry-plate processes, the coffee process seems to have grown in favour, and by its aid some of the choicest landscapes we have seen have been produced during the year by Mr. Whitehouse, details of whose mode of working appear in our last volume.

Silver printing has not undergone any change. Few complaints are heard as to difficulties in the method, or lack of excellence in the results. Occasional troubles arise in the form of minute spots, which cannot always be traced to a source and banished, and still more frequently from causes which can be readily detected and removed. But the complaint of instability is not less frequent than ever; the subject has elicited much discussion during the year, especially in relation to the alleged increase of fading. No new thing was elicited during the discussion, but the old lesson of the necessity of precision and care in carrying out known operations, such as fixing and washing, were enforced and illustrated.

Carbon printing has been spreading during the year, and continues amongst many portraitists throughout the country to be superseding silver for the best class of work. The general quality of the work has also improved, and the average quality of the carbon prints which come under our notice is not inferior to that of silver. Many of the difficulties in the general application of the process in small establishments are disappearing as experience is obtained, but, as may be ascertained from the correspondence now progressing in our columns, there is still something to desire in various facilities for success in the work.

Photo-mechanical printing processes continue to extend in number, application, and excellence. The Woodbury-type process has assumed a recognized position amongst the industrial arts. Its excellence leaves nothing to desire and it is worthy of the extensive recognition and application the process has now acquired. Photo-collography processes are extending. Mr. B. J. Edwards has introduced a form of this process, under the name of phototint, which yields fine results. Mr. A. Pumphrey has introduced an excellent method of the same kind, an example of which is presented with our YEAR-BOOK OF PHOTOGRAPHY.

The modes of shortening exposure by the use of diffused light, either in supplementary exposures or other modes of applying it, have not been much discussed during the year; but they are, we believe, in many cases adopted. A method of increasing illumination has been patented by Mr. Vanderweyde, the details of which have not yet been published. An improved form of studio has also been patented by Mr. Slingsby, the purpose being to get better modelling and decreased exposure. So far as we have seen results, these aims appear to be attained.

Theoretical points have not received much attention or discussion during the year. The only discovery of the year is that of Captain Abney, to which we referred a few weeks ago. In the earliest days of photography various attempts were made, and in some cases with success, to develop an image upon a surface which had not been exposed to light, as described in the record of Moser's experiments, and those of M. Claudet and Mr. Hunt; but in the discovery of Captain Abney entirely different principles seem to be involved, and a more practical issue seems to be promised by the application of the discovery.

Turning to the applications of the art, there is expansion, but not much change, to chronicle. Portraiture, at all times the most important branch of photography as an industry, has not undergone much change. A pretty modification in the treatment of cards and cabinets was introduced by Mr. R. Brown in his "mezzotint vignettes." This consisted in introducing, by means of double printing, a grain or stipple into the vignetted backgrounds of his portraits, masking the face so as to protect it from the grain. By the effect of contrast thus gained the flesh appeared more delicate and soft, as compared with the apparently rough and granular character of the background. This style attained some vogue. For the rest, there has been little novelty in portraiture, unless, indeed, the extended practice of printing portraits in carbon constitutes a novelty. The use of photo-mechanical prints for the purposes of book-illustration has extended very largely during the year, and forms a most important feature in the extending applications of the art.

Photographic Societies have been active during the year, and there has been some increase in their numbers. An active Society has been revived in the West of England, and a Society has been commenced or re-suscitated in Glasgow. The Society of Great Britain is slow in recovering its old tone of activity and cordiality, a half-hearted uncertainty as to its future apparently prevailing amongst many. Its exhibition was, in the year just past, less successful than usual. The causes have been discussed, and will probably be avoided in future. The Exhibition projected by the Edinburgh Society some month ago has recently been opened, and proves to possess, in numbers and excellence of contributions, all the elements of a success which we cordially hope for it.

VIOLET LIGHT FOR STUDIOS.

ALL photographers know that the violet ray is the most energetic in its photogenic action, and from the earliest days of photography experiments have been made with a view to utilise this ray only in photography. Studios have been glazed with blue or violet glass, or their interiors have been coloured with a similar tint, so as to secure violet reflecting surfaces; lenses have been made of blue glass, printing frames have been fitted with blue or violet glasses, the aim being in all cases by utilizing the blue or violet light only, and excluding all other light, to shorten exposure. General experience has been to the effect, however, that loss rather than gain in actinic energy has been the result of displacing white glass by that of any special colour. The tendency of modern observation and experiment is to demonstrate that some degree of actinism is found in, or is associated with, all the solar rays. But assuming that actinism were found in the blue and violet rays only, and that the red and yellow rays were neutral, there is no reason why the use of blue or violet glass should diminish exposure. White glass transmits all the rays, permitting the passage of just the same amount of actinic energy as the tinted glass. If white glass kept back some portion of the actinic rays which the tinted glass permitted to pass, there would be some reason for believing in the virtue of the tinted glass. Or, if the yellow and red solar rays which,

with blue, go to form white light, were not simply neutral but had a retarding influence, then the use of a glass which excluded such rays from the studio would doubtless be useful. But general experience is antagonistic to either supposition. A simple test is easily applied. Expose a piece of sensitive paper under two strips of glass, one quite white or colourless, and the other violet; both pieces of glass being of the same thickness. This we have repeatedly done with glasses of various tints of blue and violet, invariably with one result; we have found that coloured glass always retarded slightly, the light acting most perfectly through the most colourless glass. If non-actinic rays exercised a destructive action, instead of being neutral, the exposed plate, when uncovered in a dark room, would be subject to injurious influence the moment it was removed from the dark slide. A little reflection will make it clear that unless violet light admits more actinic light than white glass, or unless non-actinic rays are destructive instead of being neutral, no possible advantage can be gained by the substitution of the tinted glass for white.

The oft-repeated theory has, however, again been revived. Recently M. Scotellari brought the subject before the French Society, describing a method which he patented of applying a violet varnish to the glass in the studio to avoid the cost of violet glass. He affirms he reduces the exposure by nearly one-half, getting, at the same time, softer, more harmonious, and better modulated negatives. How this is attained with the same amount of light slightly obscured by a coloured varnish is not explained, and does not appear clear. In the studios so lighted, which we have seen, there has not been much appreciable difference in the actinic effect, but a certain inconvenience has arisen in estimating the light and shade in the image, and a certain depressing effect in making everything everybody "look blue."

From some curious experiments recently recorded by M. Paul Bert, it would at first sight appear that the actinic rays of the spectrum in some cases exercise a destructive or poisonous effect on plants. Lighted through blue glass the leaves are supported vigorously on petioles, whilst under red light they droop and are feeble. But, strange to say, he alleges that under the influence of green light they wither and die—a circumstance in direct antagonism to the many experiments of Robert Hutton in the same direction. The especial experiment by which M. Bert supports his position consists in placing a sensitive plant in a lantern having red glass on one side and green glass on the other; the plant is seen to recede from the red glass and, towards the green glass, where it eventually withers and dies. The fact that the plant turns towards the green should suggest that it was more benefited by its action than the red, and the final death of the plant to insufficiency of the light upon which life depends.

Nevertheless it is possible that some as yet undiscovered injurious or destructive action exists in the non-actinic instead of the merely neutral character with which we have been credited, which may make their exclusion from studios desirable. Hitherto we have not met with illustrations of such a fact or any theory upon which the possibility might be based. We have met with able photographers, however, who spoke of experiences favouring the use of violet glass. If any of our correspondents have definite experience in the matter, we shall be glad to receive details.

THE INTERNATIONAL EXHIBITION OF 1878 IN PARIS.

OUR Paris correspondent has already called attention to the next International Exhibition which is to be held in Paris next year. Unlike most of the capitals of Europe, Paris can command at any moment a large attendance of visitors, not only because of its ordinary attractions,

by reason of its being so conveniently situated. From Great Britain, Germany, Holland, Belgium, Austria, Italy, and Spain, Paris is easily attainable, while to our friends on the other side of the Atlantic it is at any rate more com- at-able than most parts of our continent. For these reasons, if for no other, an International Exhibition is sure to attract visitors even if the circumstance were wanting that most people are only too glad to have an excuse for visiting the brilliant capital of the French Republic.

It is unfortunate that North Germany, as a State, has refused to be represented at the forthcoming Exhibition. As the gathering is nothing more than a symbol of commerce, and may be regarded before anything as a work of peace, this decision on the part of the German Government is much to be deplored, and it will not be surprising to hear such refusal ascribed to churlish and selfish motives. If we are to believe their own representative at the recent Philadelphia Exhibition, who reported bitterly against the German exhibits, they have much to learn by a comparison of their manufactures with that of other nations, and this is surely one reason the more why they ought to have supported the next universal exhibition in Paris.

Already a good deal of work has been done in connection with the Exhibition, and the grounds and park that are to surround the building have been taken in hand and planted. The arrangements for the reception of exhibits are also far advanced, and, in the second group of objects, consisting of educational articles and materials and processes for the practice of the free arts we find in Class XII.—photography—M. Ernest Lacan has already given the names of the jury of admission, of whom half have been chosen from the French Photographic Society. This jury, as soon as it has made its selection from the objects sent in, will have concluded its labours, and then a second jury, chosen by vote from among the exhibitors, will proceed to make such awards as they think proper.

The Exhibition is to open on the first of May, next year, and it will remain open until the 31st October. The regulations about admitting objects for exhibition are not as yet quite mature, but so far as we can learn at present, exhibitors will not be charged for the space their goods occupy. The arrangement of their objects, and such cases and stands as may be required for the proper exhibition of the contributions, will, however, as a matter of course, have to be paid for by exhibitors. They are requested to affix to every object sent in, the price of the same, so that its value will be apparent to the spectator.

The date for the sending in objects has not yet been fixed, but an intimation has been made that all goods forwarded direct to the Exhibition building will be exempt from duty, and will be delivered unopened. More definite information than this has not yet come to hand, but, as soon as further details reach us on the subject, we shall have great pleasure in laying them before our readers.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

In taking a first survey of the Exhibition we are struck with the fact that even a cursory examination of the pictures displayed affords ample evidence of the firm hold which carbon printing has already taken both at home and abroad. Foremost, in point of size at least, are a number of the pictures with which visitors to former exhibitions are familiar as the work of the Autotype Company. They here contribute largely; but as most of the work has already been noticed while in the London Exhibition, we need not enter into detailed criticism. Tasschler Brothers, of St. Fiden, show twelve charming *genre* pictures (13 and 14). They are single-figure subjects with backgrounds applied to the negative by a separate operation. The pigment is a warm purple-brown, and the

surface quite free from gloss, yet the prints are brilliant and full of delicate detail. Strumper and Co., of Ham- burgh, in No. 12, have a dozen photo-mechanical prints of much interest. They are views in Ham- burgh and Vienna, and, but for the almost offensively high polish, would be readily accepted as excellent silver prints. In No. 182, Charles Schulz, of Dorpat, shows three views in Russia, of large size and well printed. T. Geldmacher, Frankfort-on-Maine, No. 874, has a frame of beautiful specimens of printing on textile fabrics and on metals; those on satin, of various tints, being specially brilliant. Goupil and Co. exhibit a dozen choice specimens of photo-engraving, re- productions from paintings, of which (676) "The Last Cartridge" may be taken as a fair sample. The Berlin Photographic Company also show fine reproductions, but they are in silver, and on that account hardly find so much favour. Lambertype and chromotype are well re- presented; C. Ferranti, of Liverpool, and J. G. Hameter, Dordrecht, each shows a frame of very fine prints by the latter process.

Enlarging seems rapidly gaining ground in land- scape as well as portrait work, and a large proportion of the exhibits consist of enlargements. Mr. Vernon Heath has a fine series of Highland scenery, and as he also exhibits prints from the 12 by 10 negatives from which they were made, we have an opportunity of judging how much loss, if any, has been sustained in the enlarging pro- cess. "Glen Slighachan" (327) and "Scour na Gillean" (328) are magnificent specimens, and show unmistakably that in some cases, at least, when the negative has been taken with a special view to enlarging, the enlargement is really finer than the small print. Mr. Wilson, of Aber- deen, is an extensive exhibitor of enlargements; and as he has recently fitted up all needful appliances for that kind of work, we have an opportunity of seeing how far success has attended his efforts. His groups of "The Queen and Princess Beatrice" (783), and of "The Queen, Princess Beatrice, and Prince Arthur" (97), are very fine. "Dr. Pirie, of Aberdeen" (512), is rather darkly printed; but No. 410, "Portrait of a Lady," is very good. Of his four frames, Nos. 296, 307, 316, and 331, of small direct landscapes in his well-known style, it would be superfluous to speak; they are quite up to his high standard; the cloud effects in No. 307 are most charming. Mr. A. Williamson shows twenty-four views of Highland scenery of more than average good quality. A few of them, such as "Glars Corrie Burn" and a "View on the Elchaig," are very beautiful. A. Kareline, of Russia, exhibits very largely, and nearly everything he sends is good. A series of groups and figure studies are well worth careful study, both as regards lighting and arrangement. Some of his effects, such as that in No. 775, where a lady and gentle- man are seated in a room lighted by a single window, are puzzling at first; but a closer inspection shows it to have been printed from more than one negative. His No. 506 is one of the most charming pictures in the Exhibition, and shows him to be a complete master of light and shadow; a lady, with a black velvet dress and white polka, is seated before a mirror, in which she is beautifully and perfectly reflected. The white portion of the dress is full of delicate detail, and yet the folds of the black robe are properly lighted, and perfect in gradation. As a whole the picture is admirable; and not the least wonderful thing about it is that it is almost, if not altogether, free from retouching.

PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

Collodion in the Carbon Process.—The use of collodionized glass as a temporary support has done very much to facilitate the manipulations of carbon printing. Many accidents which occur on single transfer, and on double transfer, both by means of flexible support and waxed and resinized glass, very seldom or never make their

appearance when collodion is used as a substratum. A an instance—an over-done print on paper, whether single or double transfer, can be weakened but to a slight degree. If the weakening process is pushed far by the long-continued use of water at a moderate temperature, the gelatine films become disintegrated, or like rotted. If this be attempted by using hot water, blisters almost invariably occur. With collodion as a substratum, a much over-done print can be weakened to the proper point, whether by means of hot water or long soaking. How far the following example will show: a weak, over-done print, after having been considerably reduced, was, at the end of the day's work, left in the pan until the next morning, when the weakening process was resumed, and the print was, finally, by the long-continued action of hot water, brought to the required point. The degree of sensitiveness of prepared tissue being somewhat uncertain, it is always safe, when the right exposure cannot be exactly hit, to lean rather towards over-exposure than under-exposure, and therefore a modification of the process, which allows of great latitude, is particularly valuable. The collodion substratum has also the advantage of retaining, with great tenacity, the more delicate half-tones in the lights, which, when paper is used, are often washed away in a forced development. The physical properties of the collodion have considerably to do with the success of the operation. A very tough collodion should be used then. If too thick, the film is apt to loosen during the development; thin collodion, however, when not of a tough nature, will cause the print to adhere too much, and to detach with difficulty in the final transfer. Such collodion can be toughened by the addition of a few drops of castor oil.

Variable Sensitiveness of Bichromate Tissue.—Vigour in Carbon Prints.—It is a well-known fact that sensitized tissue increases in sensitiveness by keeping, it even varying from morning to evening. This is probably caused by a certain degree of insolubility induced by various influences, the consequence of which is that the action of light necessary is lessened. Prepared tissue, well deprived of the excess of bichromate, and rapidly dried in an air current, is in its least sensitive condition, but it is in the best possible condition to adhere well to the support, and to develop easily. It will also give prints of more vigour than that which has been kept some time. In carbon printing, the same as in silver printing, sensitiveness and vigour do not go together. Twenty-grain salted paper will yield dull prints from negatives which will yield vigorous prints with five-grain paper, but the first is much more sensitive than the last. Tissue, sensitized in a six per cent. bichromate solution, will give duller prints than that sensitized in a two per cent. solution, but will be three or four times more sensitive. This variation in the vigour obtained gives us the means of making use of both thin and intense negatives, varying only the strength of the bichromate solution. The use of several different solutions is, however, unpractical and troublesome. The same effects may be obtained in a more simple way, by using one solution and varying the length of time of the immersion. An immersion of sixty seconds will give much less sensitive tissue and more vigorous prints than one of three or four minutes. By properly timing the immersion, as vigorous prints from thin negatives can be made on carbon as on albumen paper. Most of the carbon prints made from thin negatives suitable to the old process are admired for their softness, but lack decidedly in vigour. The cause of this, I think, owing to too long an immersion. It is generally recommended to leave the tissue in the bichromate until it begins to show a tendency to curl up; this takes about three or four minutes. If this practice is to be followed, we have to go back to the kind of negatives we made fifteen or twenty years ago. If the printer troubled with want of vigour will try an immersion of sixty or ninety seconds, he will find that his prints improve considerably. In ex-

treme cases, the immersion may be shortened to twenty-five or thirty seconds, the superfluous solution being immediately removed by means of the squeegee. One caution when resorting to short immersions. It is necessary to make use of tissue which, held up to the light, is seen to be free from waves and veins, as these would in every case be reproduced in the print. The special Autotype portrait tissue is free from these defects.

RETICULATION IN CARBON PRINTS.

BY WILLIAM BATHO.

A short time since I had the opportunity to offer to the notice of your readers what I thought and still think the remedy for the sticking of carbon prints to the rigid temporary support (presuming the waxing to have been properly performed). Now it is intended to treat of a defect the name of which heads this article.

In all trades and professions there are two classes that may be divided "thusly": they who simply care to know that a certain mode of procedure yields success, and they who know this, and in addition, the reason why it does so. The former class may save themselves some time by skipping a portion of this paper; the latter may possibly benefit themselves by following me in the details of experiments that led to the means by which this difficulty has been overcome. Knowing my fallibility, it is better to give the premises leading to my conclusion. It may be added that the experiments were not performed with the specific object of "reticulation" in view, yet all other information obtained that has not in my idea some bearing on the point at issue is suppressed.

A number of tissues were taken, the temperature at which they were respectively soluble ascertained when unsensitized, and again when sensitized, and kept for twenty-four hours to dry. Here they are tabulated:—

Name of Tissue.	Temperature of Solubility Unsensitized.	Temperature of Solubility Sensitized.
Lambertype portrait ...	83.5°	92°
" contretype ...	90	95.5
Ex purple special ...	81.5	91
Auto-brown special ...	88.5	93.5
Red chalk ...	85	94
Sepia ...	85	92
Purple ...	86	96
W. B. ...	86	94
Transparency special ...	90.5	94.5

Here was a circumstance quite unaccountable: that tissue most carefully preserved from the action of light should be insoluble at the same temperature as it was soluble when unsensitized. Still, as in each case given the result was a mean of six experiments, it could not be well questioned. Yet it did not satisfy me, and other trials were made with this result, the description of which is given in the words as they were written at the time the experiments were made. "This, however, is not found to hold good, for if the water be kept steadily at the temperature given for unsensitized tissue, an insoluble film after a time leaves the face, and the tissue underneath them dissolves as freely as unsensitized. This appears to indicate some surface action—endeavour to find how brought about."

Another circumstance that gave great help on the way, viz., that those tissues from which the thickest film fell off (the thickness could only be estimated by density) yielded the results most free from reticulation, but with this disadvantage, which might have been expected, the least purity in the whites. With these facts before us let a reticulated print be examined under ordinary magnifying power it will be seen to have well defined cracks forming a network, yet this is never seen on flexible support. Possibly this defect on the rigid support, is owing to the tissue being in an expanded state when placed thereon, the drying bringing about a contraction which results in

the fracture of the film containing the picture. In the case of flexible support its elasticity may prevent this, be it as it may, a preparation of the plate, giving it a layer, having some flexibility, totally prevents the evil. This is done to some extent with the before mentioned film, as it forms no part of the picture, which is but built upon it. Two methods of doing this, at once present themselves, first a preparation of the rigid support, or a special preparation of the tissue, the former presents more trouble to the photographer than the latter would do. If a waxed and collodionized plate be coated with any of the gelatine preparations that have been recommended for developing transparencies upon, and allowed to dry, again moistened so as to cause the gelatine to swell, the exposed tissue laid on in the usual manner, and the ordinary operations gone through such prints will be quite free from reticulation. The layer of gelatine has been tried between the wax and collodion between the collodion and picture, and without collodion altogether. In two of these cases, the picture would not be "impermeable." A gelatine solution may be made for this purpose, as follows:—

Gelatine ...	...	...	...	50 grains
Water ...	...	...	...	1 ounce
Chrome alum ...	...	...	...	1 grain

It now remains to say how this might be effected in the tissue. Clearly there is a risk of degrading the whites unless the insoluble layer on the surface contains no pigment, and there is a difficulty in maintaining the mechanical condition necessary in such a compound film. With myself, however, this is as yet the experimental stage: obviously such tissue cannot be made at one operation, and must cause more expense in manufacture; further than this it is not wise to go at present.

Correspondence.

CARBON PRINTING IN COMMERCIAL PORTRAITURE.

DEAR SIR,—Your able and powerful article under the above heading, in your issue of the 15th ult., and the praise it contains of my efforts, appearing as it does to me a direct challenge, have induced me to send you a few lines, which, if they be not intended to solve difficulties, may at least be considered as the way to that end, and will probably be the precursors of full information.

To your first question, "Is it possible to make any form of carbon printing commercially available for the daily work of portraitists?" I am able to say, without hesitation, that there are several forms of carbon printing so available, and that their results can be presented in a variety of acceptable forms to suit the most fastidious—high gloss, semi-gloss, and no gloss! After this enumeration you see at once that were I to stop for a moment to explain what I have stated, I could never end this communication to be included in one of your issues; the same difficulty meets one after reading to the bottom of the first paragraph, and I must answer laconically, if I am to leave myself room to answer at all. I consider the improvement made during the last twelve months (not the last twelve years, as you put it, because the carbon processes have only been introduced to the profession for that space of time in a reliable and practical form) as absolutely marvellous, and I am justified in this assertion, when we see carbon prints which put the finest silver prints completely into the shade. The difficulties only exist for the unskilled, and the way to overcome them is by close observation and practice, bearing in mind that it is necessary to master the "art" (I very much object to your word "trade") of carbon printing, before expecting that the public will appreciate any lame result obtained on the simple plea of permanency. When a picture, more beautiful in all its aspects than the silver print, can be produced, and can carry with it the additional

merit of not being subject to fading, it will be found that the public will demand such pictures, and be content with no others. "Granulation and reticulation" are simply delusions, inasmuch as they are the result of bad manipulation.

You say very truly "that the fact of being even a skilled photographer gives no especial qualification for carbon printing." On the contrary, it is apt to get up an amount of conceit which places him who ought to learn, quite beyond the seeking of instruction. I have now come to what I consider the very best part of the article under my consideration, the cream of it, I may say, as far as carbon printing in its present state is concerned, and as the exhortation comes from you, I cannot do better than wish the words to be reprinted, much as I should have liked to have uttered them myself. "Tuition, oral or written, aptitude and experience, are necessary to success, and these aids combined are certain to bring success." These suggestive words should be well digested by all, and especially by one of your correspondents who has signed himself "An Experimentalist." And as I have just written this word, without any reference to your correspondent, who is of the right turn of mind, I would just say with Canning, speaking of his friends, "Save me from the experimentalist" in carbon printing!

You say that the great excellence to which silver printing has attained is due to the combined effort of many experimentalists and practical men: is it not singular that after a quarter of a century of all the good influences you enumerate, we should find able photographers who cannot tell you that to a certainty their prints will not all be blistered when taken out of the water; and that the prints produced now-a-days upon paper, manufactured from the freshest albumen, fade in fewer weeks than it formerly took years to alter their complexion in the least appreciable manner?

In urging upon carbon printers to communicate their experience, there is no doubt that you plead for the benefit of your readers; but you will allow me to remark that their interests cannot be served by short articles, now and then, touching upon defects or partial success achieved. What is really wanted is a careful and exhaustive treatise on carbon printing, which shall be the work of an able and successful practitioner, whose productions shall be the only admissible proof of his right to speak on the subject. That such a book can be written there can be no doubt, but it must not be forgotten that it cannot be contained within the limits of a newspaper article.

Mr. Robinson's inquiry is not exactly conveyed in the words of your article, when he says that no mention is made by another correspondent "of the use of ice or any of the various methods of producing cold"—he can wish to express no other idea than that which must relate to the temperature of the water, as it is obtained from the cold water tap when the prints have to be immersed in it previously to being applied to the support on which they must be developed. I have no doubt that he refers principally to the excessive heat which has been experienced this summer. I have been determined throughout to take no notice whatever in this, as in many other matters connected with the process, of rules laid down, and I never suffered for it—I never met with running tissue, except that which, from the consumption I made of it, helped to run up my account with the company to a pretty high figure. My carbon printing has been done in a gallery where the temperature has often reached one hundred degrees, the cold water varied from fifty-four to fifty-eight degrees, and that was precisely the time at which I had the least waste, and when some of my very finest pictures were produced, one of which was sent by a lady to Nottmann, of Montreal, who pronounced it the finest thing he had ever seen; and others—cabinets of distinguished singers which were sent to Italy. In fact, I may add that the water which was used to soak the prints for development was also used as it came from the tap, to moisten and prepare the

transfer paper, and with excellent results after five minutes' immersion. In the fourth paragraph of your letter you point to the Autotype Company, and state that to it is made the appeal for information more directly than to any one else. If I may state my opinion on this point, speaking as one of Mons. Lambert's licencees—as one consequently who has gone to the best sources of information, and has not expected to do it all on the "cheap," I deliberately say that when the company has supplied us with suitable materials, we have no right to expect anything more; and I must take this opportunity of stating that I have yet to learn that the company has ever supplied bad or unworkable tissue, as too many people would have us believe. We, as Lambert's licencees, who have paid for, and have a right to, a special tissue of a certain tint, may have had good cause of complaint at finding that, without being consulted on the subject, our tissue was manufactured of a colder tone, but even then, and much as it vexed us, we could not in justice say that the tissue was bad. In all probability the company was animated by the best of intentions, and only wished to remove the excess of fleeting pinks which had been so violently spoken against and written upon by wise men who know nothing about carbon printing, and to whom I would undertake to show that they know nothing about it even now.

You are too sensible and equitable, Mr. Editor, to expect that the Company should roll up, in every band of tissue, the necessary amount of skill, experience, and talent to produce admirable works of art. The day on which they will have discovered the admirable process by which their "magic wands"—we naturally think of those things at this time of the year—could accomplish such a miracle, I will make all possible efforts to effect a partnership in the concern.

I hope that from the above it remains established that most of the difficulties are more imaginary than real, and that the Company has nothing to do with them. My only surprise is that such splendid tissue can be manufactured after only limited experience, when it is taken into account that a quarter of a century's labours in the other direction have only resulted in a more easily deteriorated article!

C. FERRANTI.

Liverpool, December 23rd, 1876.

CARBON PRINTING.

SIR,—Our good intentions sometimes play the fool with us. I asked a question, answers to which I thought would be useful, not only to myself, but to many of your readers. But your anonymous correspondent, who signs himself "A Successful Worker," is angry with me, as an anonymous correspondent, for endeavouring to obtain information on a photographic subject through the pages of the PHOTOGRAPHIC NEWS, and recommends me to apply, with a fee, to certain teachers of the particular branch of photography—carbon printing—on which I asked a question.

The Autotype Company must be obliged to its eager tout, "A Successful Worker," for his disinterested recommendation; but it seems to me that it was scarcely complimentary to the NEWS, to which photographers are in the habit of applying for aid and assistance in their art, to suggest that information on such a purely photographic and simple matter as that about which I wrote ought not to be asked for in its pages, and that in future all such information should not be looked for in the NEWS, but should be applied for, with a fee, to the Autotype Company.

I cannot help thinking that the Autotype Company would be glad of the opportunity of repudiating the notion contained in "A Successful Worker's" letter, that they object to photographers attempting to gain any information on carbon printing except from themselves, for a fee.

Will your anonymous correspondent be shocked if I still sign myself, anonymously, A CARBON EXPERIMENTALIST?

THE USE OF CYANIDE.

DEAR SIR,—Notwithstanding all that has been written concerning the deadly effects of cyanide poisoning, and the risk that photographers run in this use of the pernicious agent to remove silver stains from the hands, the custom of washing in cyanide solution still prevails. It is a query whether the cyanide is applied in the form of solution, or whether it is rubbed on the hands in its original form. I confess that all the sad experiences which I have read in the photographic journals have failed to induce me to give up the practice of cyanide washing. I have suffered nothing, and therefore I fear nothing. This is matter-of-fact logic. I am an operator, and therefore what I have to say about removing silver stains does not apply to printers, or, at least, to those who contract silver stains by sensitizing paper. Every photographer knows that such stains are difficult to remove.

After my day's work is over, I naturally desire to go home with clean hands; and my method of fulfilling that desire is as follows:—I keep, in a stoppered bottle, a saturated solution of cyanide. I pour a small quantity of this into an ordinary beaker, just enough, in fact, to reach to the first joint of the finger. After use, this is returned to the bottle. I then well soap my hands, and dip consecutively the fingers of each hand into the cyanide solution in the beaker, and then, with a smooth piece of pumice-stone, I remove every silver stain, as easily as one could wish. I never rub my hands with a piece of cyanide, which I consider to be a bad practice, for two reasons: the pieces are likely to be broken off, and to lodge under the finger-nails; or, the hard chemical may possibly scratch the skin, and so enter the system. The soaping of the hands may, to some extent, prevent the deadly agent from entering the skin; whether it does so or not, chemically and philosophically, I know not; all that I know is, that this has been for many years my method of removing silver stains, and it is a method that I am likely to pursue for many years to come.—I am yours truly,

J. KAY.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the next meeting of this Society, on Tuesday next, at 5A, Pall Mall East (when the Exhibition of the Water Colour Society will also be on view), a discussion will take place on Carbon Printing, to be opened by Mr. S. Fry.

A URANO-PHOTOMETER.—The intensity, colour, and polarization of the diffuse light of the sky in different parts has recently been a subject of study by M. Wild, of the St. Petersburg Academy, who has endeavoured to measure it with a somewhat complicated instrument devised by him, and named a "urano-photometer." Referring to the Academy's *Bulletin*, for the account of this instrument, we may here give briefly the results at which M. Wild has arrived:—1. Proceeding from the sun in a vertical circle northwards, it is found that the colour of the light gradually changes from the red end of the spectrum towards the violet, and at about 80° distance from the sun it reaches about midway between the Fraunhofer lines C and D (corresponding to a wave length of 0.000528 mm.); from there on to the horizon the colour gradually goes back towards the red end of the spectrum. Thus, in St. Petersburg at the time of equinox, the sun having about 60° zenith distance, the colour tone of the diffuse light at 80° angular distance (in a vertical circle) is mostly pure blue, and passes on either side into green. 2. The saturation of the colour appears to reach its maximum at 90° distance from the sun, where also the degree of polarization is a maximum. On either side of this maximum the degree both of polarization and of saturation of colour decreases pretty regularly. 3. The intensity of the diffuse reflected light of the sky appears, on the other hand, to be at its least at about 80° distance from the sun, and from there it increases less quickly towards the horizon than towards the sun. Thus, while at 140° distance from the sun the intensity is about five times greater than

at 80°, at 20° distance it is over seven times greater. Southwards from the sun the intensity is considerably greater than northwards for the same distance. Thus, at 20° distance southwards it is nearly twice as great as the same distance northwards. These researches are being further prosecuted by the author.—*Nature*.

OXIDIZING AGENTS.—We are frequently asked by correspondents to name some of the leading agents employed by chemists to produce what is called oxidation. The operation is an important one in the arts, as upon it depends the success of bleaching, disinfection, and similar processes. We will mention some of the methods now preferred by chemists for the purpose indicated. Ozone, if it could be cheaply made, would be almost invaluable, but the cost of production stands in the way of its common use. The permanganate of soda or potash is a chemical compound that cannot be excelled in its oxidizing properties, and its use has gone on steadily increasing for years. In England, under the name of Condy's fluid, it is a common article about the household, and for hospitals and bleacheries it is coming into vogue. A little more knowledge of its value would soon lead to its production on a large scale. Bleaching powders have long been known and used as oxidizers, and, as they can be had in any quantity, are likely to continue to be employed. Chromic acid, whether in saturated or dilute solutions, has the power of converting carbonic oxide into carbonic acid readily and completely under ordinary temperatures. Ammonia gas is powerfully oxidized by it, and it readily destroys organic matter. The chlorates and nitrates can also be mentioned in this connection.—*Scientific American*.

INK STAINING.—Grimm, in the *Polytechnisches Notizblatt*, proposes the following method for removing indelible ink and other silver stains without the use of cyanide of potassium. Chloride of copper is first applied to the taint; it is next washed with hyposulphite of soda solution, and afterwards with water. It is said that this may be employed on coloured woven cotton tissues. For white cottons and linsens, dilute solutions of permanganate of potash and hydrochloric acid, followed by the hyposulphite of soda and clear water, is preferable. For cleaning the hands, iodine dissolved either with iodide of potassium, or in alcohol, is used, following by aqueous ammonia.

ENCAUSTIC COLOURS.—Encaustic colours are the various metallic oxides given in the following list. When more than one substance is used for colouring, the proportions must be varied to suit the tint required. For violet, use iron or manganese with soda; for purple, chloride of gold with tin and chloride of silver; for black, iron, manganese, uranium, and iridium; for blue, cobalt, carbonate of cobalt, smalt or silicate of cobalt. Zinc will brighten blue colours. For indigo, use the materials employed for both violet and blue; for turquoise, use copper with soda, or cobalt with man and soda phosphate; green may be obtained with copper, either with or without antimony, or by chrome with cobalt; for bronze green, use nickel. Zinc, or carbonate of zinc, will brighten this colour. For olive green, use nickel with cobalt; for yellow, use antimony with potash, titanium, chromate of lead, and chromate of barytes. Zinc will brighten this yellow. For buff, use the materials for yellow, with iron, sapie, sienna, ochre, and umber; for orange, use uranium, or the sulphide of antimony with iron; for red, use iron, chromate of iron, sulphate, copper, and ochre; for carmine, chloride of silver; for pink, iron and chrome, with potash; for brown, use iron, chromate of iron, manganese, with or without cobalt, ochre, and hammer oxide; for grey, use iron, cobalt, iridium, platinum, titanium; for white, white clay and five per cent. of oxide. The colouring oxides are used in quantities of from five to ten per cent, sometimes from fifteen to twenty per cent. No definite rule can be given for quantity. Some of these oxides act as fluxes, and great skill must be used in their employment, in order to prevent the melting of the tile. For the preparation of these colouring agents, and for other very important information relating to pottery, Beckwith's work on "Pottery" will be found a useful work of reference.—*English Mechanic*.

To Correspondents.

P. BROWN (Hants Home).—For architectural and other views in confined situations the lens you indicate by A is decidedly the best; and for ordinary landscapes D is decidedly preferable to B, or, indeed, to any in your list.

M. G.—There is no necessity for transparencies intended for ornamentation of windows to be varnished. They should always be covered with glass, or, if fixed in the window, they should be placed with the face in contact with the glass already in the window. 2. So far as our experience goes, wooden baths, lined with pure india-rubber, answer perfectly.

F. BATHMAN.—If you dissolve 6 ounces of protosulphate of iron in 10 ounces of water, you will obtain a saturated solution. From these figures you can calculate the proportion required of a saturated solution to make a developer of any strength you require.

J. R. TUNNICLIFFE.—There is undoubtedly promise in your work produced under such difficulties, and with so little practice. Take pains and persevere, and you will doubtless succeed. No. 1 is best, and would have been very fair with better facilities for controlling light and shade. No. 2 suffers from the same cause, and is moreover a little under-exposed and over-intensified. In No. 3 the sitter has moved, otherwise it would be pretty good. No. 4 is best. You will improve when you obtain better appliances. Try to get some good examples, and work up to them.

R. T. W.—For all large negatives we prefer patent plate for safety, but it is quite possible that, in certain hands, crown glass may serve, which is, of course, lighter to handle and lighter in cost. 2. If you wish to transfer a negative film to paper, for printing purposes, a piece of thin Saxe paper will answer well. It should then be waxed at the back. 3. As a rule wet plates are used for making enlarged negatives from transparencies, but in some cases an enlarged transparency is used, and printed by contact on a dry plate. Any kind of dry plate may be used, that with which you are most familiar will answer best. See Captain Atney's article in our Year-Book just published.

RALPH FOSCOLO.—No. A acquires no exclusive right, and B is at liberty to photograph the same or any other point of the same building, that is, in photographing a building or landscape, or indeed any subject which he may have the right and opportunity to photograph, a photographer acquires no exclusive copyright by priority. Any one else may photograph the same building or landscape, or indeed any subject, by its owner's permission, without infringing on the copyright of the preceding photographer. In short it is copying the existing photograph, not photographing the same subject, which constitutes piracy.

J. C. HAYDN.—The maker you name has been dead many years, and the establishment no longer exists. The cause of the defect you name is simply the fact that it is a lens of inferior manufacture. We have seen some pretty good instruments bearing the name, but the manufacture never stood high. The only cure available for the small field which is in focus is the use of a central stop. Take a piece of blackened card, make in it a circular aperture of half the diameter of the lens, and place it a little distance behind the front lens. You will find this materially extend the field of definition, but of course the exposure will be increased. The image on the plate having no definition, whilst the image on the ground glass had, is due to one of two things: either the dark slide is at fault, and does not place the sensitive plate in the same plane as the ground glass, or the chemical and visual foci of the lens do not coincide. Try the first by careful measurement, and if the plane of the sensitive plate and ground glass are found to be absolutely coincident, you may conclude that the fault is in the lens; and in that case note in which direction the focus errs, and make allowance for it in focussing, turning the focus in or out as may be required, after getting the image sharp on the ground glass.

E. B. WIGGLESWORTH.—Thanks. We shall insert the description in our next. The little instrument to which we referred was simply a small roller for running over the print and pressing it down after pasting and laying it on the mount.

J. KAY.—Thanks. We shall have pleasure in hearing further from you.

F. V. L.—When sugar is used in the iron developer less acetic acid is necessary. It acts as a restrainer both mechanically and chemically. We have used, with advantage, 60 grains of sugar-candy to a 20-grain iron solution without any acetic acid. Different kinds of sugar have varied restraining qualities, brown sugar restraining more than white sugar. Treacle is a very powerful restrainer.

G. B. P.—For many small subjects, and most if not all large pictures, paper negatives answer well. It is, of course, a matter of taste, but for many subjects we prefer them. The simplest mode is simply to take a transparency enlarged to the full extent at first. This should be intensified so as to secure a vigorous image on paper, and it may be worked on as may be required. Then take a sheet of thin Saxe paper, and float a long time, print deep, fix without toning. You will obtain a negative which will print well, and will admit of any amount of skilful retouching. Of course it should be waxed, and to some granulation do not try to iron out all the wax which the paper has absorbed.

Several Correspondents in our next.

The Photographic News, January 12, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE "TIMES" AND PHOTOGRAPHY—THE PHOTOGRAPHING OF SOUNDS ACCOMPLISHED.

The "Times" and Photography.—In a recent review of the Royal Academy album, the *Times* makes some curious and amusing blunders on the subject of photography. The art is such a general scapegoat that it seems but the acknowledged duty of every critic to point out its shortcomings, and, as it progresses, to patronise its results after a fashion. If literary reviewers would confine themselves to their proper duty of pronouncing a work good or bad, and to calling attention to its qualities from a literary or artistic point of view, all would be well, and, whatever might be their prejudices, one could find but little fault: but when, a few months back, the *Athenæum*—which, though it professes to be a scientific journal, is, as everybody knows, nothing of the sort—goes out of its way to appear clever, and suggests the boiling and steeping in hot water for some hours, in order to test it, of ordinary print and paper, simply because the same happens to be termed a photo-zincograph, one cannot but wonder where the writer could possibly have picked up the curious information he retails. The *Times*' reviewer has lately been distributing some gratis information of the same kind, which is worth about as much as knowledge of the kind usually is. Instead of confining himself to a criticism of the book before him, he must needs inform his readers on the subject of photography, and tell them what he knows about the art. This is not much. His theory of the action of photography is summed up in a few words: the pictures in the album, he says, are produced by the Woodburytype process, "in place of the ordinary process of silver photography, by which, we understand, is meant the production of the picture in the monotone of brown, which the oxide of that metal yields under the action of the sun." Our reviewer then goes on to make the matter clearer still, for fear his unscientific readers should be lacking in comprehension. "When it is understood how very distinct this (Woodburytype) is from photography or from printing, it will at once be seen how advantageous it is. The one is a chemical change, in which a colourless salt is decomposed by light, depositing its more or less black oxide in all the degrees of intensity necessary for a picture; the other is a mechanical process, in which a pigment is applied to a metal surface bearing a sort of stereoscope from the original photograph." Our reviewer is very scientific with his oxide of silver—or, rather, oxyde, as the *Times* prefers to call it—but the explanation is hardly so clear as it might be. First, he talks of a brown colour, "which the oxyde of that metal (silver) yields under the action of the sun," and then he tells us immediately afterwards that the result of the light acting upon a colourless salt is a "more or less black oxyde." Further on, again, he talks of "films of metallic oxyde" forming the photograph, so that it is difficult even for the most easily satisfied reader to understand what is meant. In any case, however, none will be more surprised, we feel sure, at this new theory of photography than photographers themselves. Woodburytype, the reviewer would have us know, is "distinct" from photography and from printing; he seems to think that negative taking is altogether dispensed with in regard to it, for he says that "the strong reds, blues, and yellows of some of our very positive colourists are conquered better than we ever see them in simple photography." The great advantage of permanency, which is one of the chief points claimed for Woodburytype, is somehow lost

sight of altogether by our reviewer, who has gone in strongly for the chemistry of the affair, while neglecting other matters of interest. This is a pity, for while his scientific opinion contains the element of novelty, it is one, we think, that will hardly receive the unanimous support of chemists in general.

The Photographing of Sounds Accomplished.—In August last we made some remarks in these columns upon the possibility of photographing sounds, and we pointed out what had already been done in this direction. M. König, of Paris, had already made some experiments, which proved, beyond a doubt, that the photographing of sounds was hardly an impossibility, but we did not suppose that the feat was then on the eve of being accomplished. M. König's researches were conducted with flames upon which various sounds were made to act, and the behaviour of the flames under such circumstances was carefully noted and sketched. Dr. Vogel, of Berlin, pointed out that by providing a revolving mirror with clockwork, so that it might revolve at a given rate, there should be no difficulty in obtaining an impression in the camera of these curves made by the flame, provided a light of sufficient intensity were employed to act upon the sensitive photographic plate. Such a method has, however, not been adopted by Dr. Stein, who has recently succeeded in photographing tones. This physicist has solved the problem by securing a record of the vibrations of a tuning-fork on string. If it is a tuning-fork that is to be employed, he fixes the instrument in a horizontal position, with its two branches in vertical planes. Through the upper branch of the fork is pierced a tiny hole, through which a bright ray of light passes on to a collodionized and sensitized plate beyond. This plate is movable, and when a clockwork arrangement is set in action, the film moves rapidly in a perfectly straight line. On the tuning-fork being struck, the branches of course vibrate, and the ray of light is naturally enough moved up and down with the vibrations. Instead of a straight line being traced upon the moving sensitive plate, as would be the case if there were no vibration or up-and-down movement of the ray, there is a wave-like mark, each wave representing one vibration. The number of waves within a certain space may be counted, and then the observer finds out the note that has been sounded. Sounds inaudible to the human ear may be photographed in this way, so delicate is Dr. Stein's apparatus, and by fixing discs upon a series of strings, each disc having a tiny orifice, he is enabled to record half a dozen sounds or notes at once, these being recorded on the sensitive plate by as many wave-like lines. Nor does this means of recording sound merely give us the number of vibrations. The waves themselves, it appears, furnish, as depicted upon the sensitive film, much food for study; they are more bright at the bend of the line than elsewhere, while the loudness of the sound is represented by the height of the waves. We have here, therefore, one more valuable application of photography to science, the first important one, we believe, that has been proposed for the investigation of acoustics. It is not, however, the only application of our art which Dr. Stein has made of photography in scientific matters. That gentleman's mode of registering the pulse and beating of the heart by the aid of photography, of which we gave an account in these columns not long ago, is one of the best methods that have been proposed for such a purpose since Dr. Ozanam pointed out the use of photography in this connection. In this instance Dr. Stein also employed a perforated disc, and we have no doubt that this last successful experiment of his is only one of the series with which he has been occupied for some years past. There is every reason to suppose that this last happy application of photography will help us to add materially to our knowledge of sound, and probably of light also—two branches of physics which still present many obstinate problems awaiting solution.

EDINBURGH PHOTOGRAPHIC EXHIBITION.

REPORT OF THE JUDGES

Appointed by the Exhibition Committee to award the Medals offered for Competition at the Photographic Exhibition in the Royal Academy National Galleries in 1876-77.

Your judges, having examined the pictures sent for competition, are unanimous in deciding on the following awards:—

1st. The gold medal for "the picture which possesses the highest degree of merit, irrespective of size or subject," to A. Karoline, Nigoy, Novgorod, Russia, for his picture (775). *Characteristics.*—Invention applied to figure subjects under skilful arrangement of light.

2nd. A silver medal for the best landscape of 8½ by 6½ or under, to Mr. William England, 7, St. James' Square, Notting Hill, for his picture, "The Wetterhorn" (768) from a dry plate. *Characteristics.*—Fine, aerial perspective, with both foreground and extreme distance in good keeping.

A bronze medal for the second best picture of the same class, to Mr. H. A. H. Daniel, 49, Broad Street, Bristol, for "On the Froom" (724). *Characteristics.*—Good choice of subject, and vigorous treatment.

3rd. A silver medal for the best landscape above 8½ by 6½, to Mr. Payne Jennings, Belgrave Place, Bathmies, Dublin, for No. 4 of his frame "Picturesque England and Ireland" (233). *Characteristics.*—Singularly clear in definition, perfect aerial perspective, and strongly expressed foreground combined with much delicacy.

A bronze medal, for the second best landscape of this class, to Mr. George Wardley, St. Ann's Square, Manchester, for his "Aberglaslyn," near Reddallert (162), from a collodio-albumen plate. *Characteristics.*—All the works of this photographer are worthy of attention, in respect to the treatment of his subject, and particularly fine in mid-distance.

4th. A silver medal, for the best portrait, from 8½ by 6½ to 15 by 12, to Mr. J. M. Young, Llandudno, for his "Hide and Seek" (457). *Characteristics.*—Although this work is titled "Hide and Seek," and a study, your judges cannot but recognise it as a portrait, and one possessing very much the qualities of the work of Sir Thomas Lawrence. The expression of eyes is beautifully sustained.

A bronze medal, for the second best portrait of this class, to Mr. James Howie, junr., Princes Street, Edinburgh, for his portrait of a gentleman (266). *Characteristics.*—This work does not embrace much treatment, but your judges regard it as a specimen of very true rendering, without the aid of modelling the negative, and thus preserving the natural texture and lines of the face.

5th. A silver medal, for the best portrait above 15 by 12, to Mr. Marshall Wane, Douglas, Isle of Man, for his portrait of Miss Carlotta la Ulerq (225). *Characteristics.*—Fine arrangement of the figure, and perfect rendering of the texture in the different fabrics.

A bronze medal, for the second best picture of this class, to Mr. J. M. Young, Llandudno, for his "Study of White Drapery" (56). *Characteristics.*—Portraiture treated pictorially, and great regard to sustaining the colour and tone of white drapery, without chalkiness.

6th. A silver medal, for the best landscape by an amateur, to Mr. Robert Crawshaw, Cyfarthfa Castle, Merthyr Tydfil, for his "Boat Pool, River Usk" (52). *Characteristics.*—Great refinement in quality, with sky in beautiful harmony.

A bronze medal, for the second best picture of this class, to Mr. John Foker, 116, St. Vincent Street, Glasgow, for his "Poland House" (75). *Characteristics.*—Very rich in quality, skilfully produced by side-lights, and, consequently, but much breadth of effect.

7th. A silver medal, for the best genre picture, to Mr. H. F. Robinson, for "His Own Fire-

side" (544). *Characteristics.*—Many of the works by this gentleman are highly meritorious through the skill displayed in combining separate negatives, in order to make one picture; but this work has the appearance of being simpler in its contrivance, and tells very directly its own story.

A bronze medal for the second best genre picture, to Mr. George Nesbitt, Bournemouth, for his "On Guard" (415). *Characteristics.*—This gentleman is very prolific in his art, and, although his backgrounds are somewhat faulty, he succeeds well in uniting his subjects.

8th. A silver medal for the best combination picture, to Mr. Adam Distin, Leven, Fife, for "The Broken Toe" (547). *Characteristics.*—This gentleman is singularly successful with a method of combining several figures on one plate by the super-imposing of various films, one after another, till the picture is complete. Your judges understand that this method was first introduced by Mr. Johnstone, of Wick, a specimen of whose work is to be seen in No. 356, wherein both sky and sea are united.

A bronze medal for the second best picture in the same class, to Mr. Samuel Fry, Kingston-on-Thames, for "The Taxidermist" (513). *Characteristics.*—Very much elaborated, chiefly created by the subject. The quality throughout is very perfect, and worthy of the closest inspection.

9th. A silver medal for the best single figure study, to Mr. R. Faulkner, Kensington Gardens, London, for his "Studies of Expression" (627). *Characteristics.*—Very original in style, and surpassingly beautiful in expression. Altogether, this artist is completely at home with children.

A bronze medal for the second best pictures in this class, to Messrs. Taeschler Brothers, St. Fiden, Switzerland, for their studies (13). *Characteristics.*—Very careful study of arrangement in all the work, and the sentiment and feeling in children exquisite. The general arrangements of the ladies' portraits are finely elaborated in combination with both natural and artificial backgrounds.

10th. A silver medal for the best reproduction from painting in oil or water-colour, to the Berlin Photographic Company, for "The Angela, by Raphael" (706).

A bronze medal for the second best picture in the same class, to Mr. John Pouncey, Dorchester, for his reproductions on wood and canvas (719, 720, and 726).

11th. A silver medal to the Autotype Company, London, for general excellence in the enlargements exhibited by them.

Your judges, in connection with this award, desire to state that although the process of enlarging is fully represented, there are comparatively few specimens that are actually the work of the exhibitor, and they have in consequence resolved to take the responsibility of slightly varying the conditions on which the medal was offered, and award it as they have done.

A bronze medal for the second best enlargement, to Mr. Benjamin Wyles, Southport, for his portrait of Miss Braddon (834). *Characteristics.*—Not unlike Sir Joshua Reynolds' in breadth and simple treatment.

12th. A silver medal for the best photo-mechanical print, to Messrs. Goupil and Co., London, for their reproduction of "Reconnoitring" (661).

A bronze medal for the second best reproduction, to Mr. B. J. Edwards, London, for his portraits (606).

13th. A silver medal for the best enamel, to Herr Goldmacher, Frankfort-on-Maine.

A bronze medal for the second best enamel, to Mr. W. T. Watson, of Hull.

15th. A silver medal for the best photograph, by an amateur who is also a member of the Edinburgh Photographic Society, to Mr. Geo. A. Panton, Edinburgh, for his "Maiden Bridge" (270). *Characteristics.*—Composition very good, clear, yet full of atmosphere, and quite equal to the work of some of the best professional landscapists. A bronze medal to Mr. R. G. Muir, Edinburgh, for the same

subject (105). *Characteristics.*—The two frames shown by Mr. Muir contain several fine bits of natural scenery. The Bridge is exceedingly beautiful in quality, owing to a full development of light.

In addition to the awards provided for in the prospectus of the Exhibition, there are several classes of exhibits not included, to which your judges would respectfully direct your attention. They would recommend that a special silver medal be given to Mr. Frederick Hollyer, of Pembroke Square, London, for his studies of Rustic Subjects, of which 473 is an example. His aim in this department has evidently been to make provision for pictorial purposes, to meet the wants of many artists in that walk, and in this respect he has been successful.

Your judges are also of opinion that a special medal should be awarded to Mr. J. Ganz, of Brussels, for his transparencies, both for decorative and educational purposes. His lantern pictures, including physiological, botanical, and mechanical specimens, are simply perfect.

Your judges think it right to say, that in all classes of exhibits, they had in many cases much difficulty in arriving at a decision (there were so many pictures of equal merit, that it was often matter of extreme difficulty to make the necessary award), and that many of the pictures that were marked "not for competition," are of the highest excellence.

Your judges have examined several frames of portraits in which very beautiful effects are produced by modelling and retouching, such (for example) as those by Mr. Gutekunst, of Philadelphia (501), and Herr Kosmata, of Budapeston (836); and although the results are undoubtedly very pretty, they consider that it would be unfair to place them in competition with pictures printed from the original and comparatively untouched negatives.

(Signed) DANIEL MACKEE, Bt., P.R.S.A.
NORMAN MACBETH, A.R.S.A.
THOMAS ANNAN
THOMAS RODGER
JOHN LESSELLS

LIGHT, EXPOSURE, AND DEVELOPMENT.

BY H. A. H. DANIEL.*

THE subjects which I have chosen for my paper are, perhaps, those demanding the most strict attention of every photographer aiming at work of the highest and most artistic class. To those who are content with what the apparatus and chemicals will produce almost independently of themselves, this paper would prove most uninteresting, superfluous, and, in short, not worth wasting time over. But I am happy in feeling perfectly assured, that to such, I have not the remotest chance of addressing myself this evening. I have done my best to bring together, in a modest way, certain results and facts that have come under my notice; but it were unreasonable for me to hope that all, or even the greater part of them, would be new to you; I therefore ask your forbearance with me should I revert to matters with which many may be already familiar, although here and there they may perchance be fresh.

I have divided my paper into three subjects, the first of which is

LIGHT.

Of this we know there are two kinds, viz., natural and artificial, the former being composed of seven primary colours, which may be classed as follows—actinic and non-actinic. Artificial light may be produced in a large number of different ways, of one or two only of which I shall speak presently. One of the most evident effects of light is its power of changing the colour and nature of substances which come under its influence—glass, wood,

vegetation, chemicals; in fact, almost every substance is more or less affected by it. The first substance I mentioned—glass—is wonderfully changed by its action, although it may be a long time before we notice it. Some time since, I saw certain fixtures removed from the surface of some plate glass, and to which they had been affixed for a very considerable period, some years; it was then very manifest to what an extent the colour of the exposed parts of the glass had been changed, and by changed I mean darkened. If, after some years, those letters we often see upon the glass of shop windows be removed, very often a most perceptible difference is apparent. The knowledge of this fact is of great importance to photographers, and should act as a forcible caution, to them to expose their lenses to the action of light as little as possible—in fact, not at all beyond what is necessary during absolute work. But while on the topic of lenses, I would just remark that because a lens may look yellow and discoloured, it does not follow that it is so. Very often the cementing balsam in lens combinations will be rapidly acted on by light, being turned to a yellow tint, and making the lens appear discoloured when it really is not. We often find in the practice of photography, that in a very dark and badly lighted situation there is an object very worthy of the camera; but a photographer should never settle down under the idea that to get a picture is impossible on account of the want of light. If there be any at all near, there is hope. It is surprising what can be and has been done by the aid of mirrors. The celebrated Dr. Vogel actually photographed some of the very remarkable interiors of the Egyptian sepulchres in this manner. They were approached by subterranean passages. At the outer end of one of these a large mirror received the sun's rays on to the mirror at the inner end, which in its turn reflected them again on to the subject. The exposures were of course long, but the end was by these means successfully attained. There is one great point in the matter of light, about which we are often very liable to be deceived. It is the great variety in the intensity and actinism of light at different times and seasons. The blue colour of the sky proceeds from the fact that the particles of air reflect blue light, the quantity varying with the hour of the day, and being strongest when the sun is highest, and diminishing as the sun sinks. Therefore, there is more actinism during the middle of the day, that is, between eleven and twelve. The power of light varies very greatly at different seasons; thus at Berlin, Bunsen found that, expressed in degrees, the chemical power of light varied as follows:—

	12	1	2	3	4	5	6	7	8	o'clock
June 20 ...	38	38	38	37	35	35	24	14	6	degrees
Dec. 21 ...	20	18	15	9	0	—	—	—	—	"

Thus we see that in winter the chemical power of light is exceedingly weak. We may also be much deceived by great brightness in the light. It does not always follow that a bright day is a chemically light day; for instance, very easily may we be deceived on a bright sunny day in February or March. These are points which, if carefully noted and considered always, would save many a negative from being under-exposed. As a last remark on natural light, I would mention its remarkable power in rendering certain substances insoluble; for instance, the gelatine, as prepared for the mechanical printing processes. We all know how the negative is placed over the pigment paper, and where the shadows are; how the gelatine, having been acted on by the light, is rendered insoluble. Apropos of this, I will just relate a circumstance in the German campaign of 1870.

In the campaign of 1870, the well-known pea-massage was one of the most important articles of food for the army, and was prepared daily by thousands. The fabrication of the interior portion caused little difficulty, but the obtaining of so many skins created much difficulty. As

* Read before the Bristol and West of England Amateur Photographic Association.

the supply fell short, a substitute was sought in vegetable parchment. This paper, which is produced by dipping blotting-paper in sulphuric acid for about a second, then washing and drying, is distinguished by its skin-like properties of resistance. It is impenetrable to water and difficult to tear; it is, therefore, used for the production of bank-notes. It was attempted to make sausage skins of this paper by doubling a sheet cylindrically and pasting it together. No glue or gum can, however, resist the effect of the boiling water in which the sausage has to be cooked, and so the artificial sausage-skin fell asunder. Dr. Jacobsen solved the problem by producing an adhesive substance, with the help of the chemical action of light, which could resist boiling water. He mixed the glue intended for the sausage skin with bichromate of potash, and exposed the glued parts to the light. This made the glue insoluble, and now the artificial skin endured boiling water thoroughly well. The number of sausage skins prepared in this way by the chemical action of light amounted to many hundred thousands.

And now as to artificial light. I will simply speak of one or two kinds. Firstly, the magnesium light used by the aid of Solomon's reflecting clockwork lamp—a capital light for enlarging negatives; the electric light, very brilliant, and most useful for lighthouses, but not so suitable for photography and the lime-light. I have used the first of these—namely, the magnesium light—as very many others have, doubtless, far more than I have, and I have found it most useful. There are many other useful chemical lights very suitable as aids to photography, the formulae for which, I presume, all present have seen given in different journals and books. For transparencies at night a very effective and actinic light will be found by using petrolene with a large proportion of solid paraffin dissolved in it. I have, with its use, successfully printed transparencies in five seconds; but light is a wide subject, and if we were to do only a little towards exhausting it, to-morrow morning would still find us occupying this room; so I will now pass on to the next subject.

(To be continued.)

ON THE ALKALINE DEVELOPMENT OF THE PHOTOGRAPHIC IMAGE.

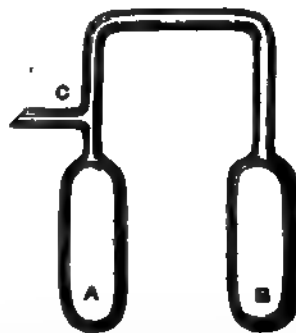
BY CAPTAIN ABNEY, R.E., F.R.S.*

Since alkaline solutions have been introduced for the development of the photographic image, there has been a certain amount of ambiguity regarding their action. It has usually been assumed that their sole function is to reduce to the metallic state the particles of silver bromide which have been acted upon by light.

The alkaline developer consists of pyrogalllic acid or other oxygen-absorber, an alkali such as ammonium hydrate, and a restrainer such as potassium bromide. These are generally mixed together and applied to the film on which has been impressed an invisible image in the camera. Those parts acted upon by light darken under the influence of the solution; whilst, if the surface be in a proper condition and the proportion of the restrainer to the alkali be well balanced, the portions unacted upon by light remain unchanged. The image thus formed is soluble in nitric acid; and further tests show it to be metallic silver. In order to discover the part which the alkaline developer played to cause this reduction, a large series of experiments have been conducted in the laboratory of which I have charge; and the results appear sufficiently interesting to be published.

Bulbs were made of the shape shown in the accompanying figure. In A was placed, whilst carefully excluded from all light, thoroughly washed silver bromide and pyrogalllic acid. In B was placed a solution of potassium hydroxide or other alkali except ammonium hydrate. If ammonium

hydrate were required, the bulb B was made double; in the first was placed ammonium nitrate, and in the other potassium hydroxide, calculated so that the ammonium salt



should always be in excess when the potassium was brought into contact with it. The tube C was attached to a Sprengel pump; and when the apparatus was exhausted, C was sealed, and the whole of the alkali caused to enter A. After from two to sixty hours the bulbs were broken, and the solids and liquid kept for analysis. As far as can be judged, the silver bromide was instantaneously attacked by the alkaline pyrogallate.

There is no action due to pyrogalllic acid on the silver bromide without the presence of an alkali, as was proved by keeping them in contact for weeks and noting their appearance.

After a large number of experiments, it was found that the amount of silver bromide capable of reduction was primarily dependent on the amount of pyrogalllic acid present, and in a secondary degree on the amount of alkali present. Thus one equivalent of pyrogalllic acid can reduce four equivalents of silver bromide to the metallic state if sufficient alkali be present to combine with the bromine liberated. The solution, after evaporation to dryness, was found insoluble in benzole or ether, &c., and only partially soluble in alcohol. A part of that dissolved was further found to be the bromide of the alkali; and the excess of alkali not in combination with carbonic acid was also found in the solution. The amount of carbonic acid was found to be considerable, equal to one equivalent of pyrogalllic acid. (It seems unnecessary to give the analysis of the organic residue.) Apparently the compound formed is totally different from that obtained by Stenhouse* when investigating the action of bromine on alkaline pyrogallate. From the above experiment, it will be noted that the reduction of the silver is independent of the absorption of external oxygen, and that only a definite amount of silver can be reduced by a given amount of pyrogalllic acid.

When, in addition to the alkali, a large excess of soluble bromide was added to the bulb B, the same results were obtained, though the reduction of the silver bromide seemed to take a rather longer time to effect. The following is an example of the quantities employed in these experiments:—

In bulb A was placed ... 300 grains of AgBr and
10 grains of $C_6H_3O_3$;

In the bulb B was placed 300 grains of KHO

dissolved in the least possible quantity of water.

The amount of Ag found to be reduced was 33.86 grains; and the amount of KBr found in solution was 36.97 grains.

Layers of thoroughly exposed and unexposed silver bromide were next treated with a rather weaker solution of the alkaline developer; and when the restraining soluble bromide was omitted, the reduction to the metallic state took place in each layer almost equally. When the soluble bromide was present in equivalent quantities with the alkali, the reduction took place first in the layer that had been exposed to light, and spread gradually into the other layer.

* Philosophical Magazine.

* Journal of the Chemical Society, January 1876.

From this we may gather that the exposed silver bromide is more readily reduced than that unexposed, and that the solution of soluble bromide and the alkali acts less vigorously than the alkali alone.

Another point to investigate was as to the means by which the density in an alkaline-developed image was produced; for it could not be supposed that merely those atoms of silver bromide which had been reduced to the state of sub-bromide would be attacked, since the sub-bromide of silver is essentially a coloured compound, and can be distinguished even in small quantities. A plate prepared with silver iodide was flowed over with tannin and dilute albumen, and dried. It was then exposed in the camera, and after exposure half of it coated with an emulsion formed in collodion by silver bromide. Now a photographic image impressed on silver iodide is not amenable to alkaline development unless the solutions be excessively strong. An alkaline developer made as below was therefore employed—

1.—Pyrogallie acid...	16 grains
Water	1 ounce
2.—Potassium bromide ...	20 grains
Water	1 ounce
3.—Liquor ammoniac (880) ...	1 "
Water	8 ounces
or	
Potassium hydroxide ...	15 grains
Water	1 ounce

One part of Nos. 1 and 3 were added to every three parts of No. 2. As might have been expected, but a trace of an image was seen on applying the developing solutions to the uncoated iodized plate (and this trace was subsequently proved to be due to the sensitive albumen salt); but where the emulsion had been used, an image gradually appeared, not very strong, but still perfectly visible, and of printing density.

Silver bromide plates were treated in the same way: in this case there was a feeble image on the part uncoated with bromide emulsion; but on that part coated with emulsion the image appeared on the bottom surface of the emulsion film, and gradually worked its way up till reduced silver was obtained on the top surface, where the light had most strongly acted on the exposed film. The recoated half-plate, on fixing with potassium cyanide, gave a perfectly bright image, clear and dense, whilst on the other half it remained feeble.

With bromide plates in which only a feeble image could be obtained, the same procedure gave the requisite density; and this fact is likely to be of practical value.

(To be Continued.)

THE SPOT PLAGUE.

BY THOMAS M. LAWS.

Of all photographic ills, the spot plague seems to be the worst to bear, and the least understood. Many fine days' printings have succumbed to its ravages. Notwithstanding the amount of discussion and liberal treatment it has received, this great bane is constantly cropping up in various printing rooms in one or other of its many phases, if the experiences of poor unfortunates who periodically pour their grievances into these pages are to serve as index. That albumenizers are alive to its prevalence is evidenced by the recent articles by Mr. Skinner. No sooner is one species successfully explained away, before another appears, and for a time holds its sway.

During the past year, spots, blue-white, sickly-looking, broke out among our prints. This being their first appearance in any shape among us, we were completely at a loss to divine their cause.

"It's the paper," cried the printer. "No; it is the sensitizing," muttered the toner. "It must be the washing," feebly whispered the mounter. The spotter said nothing, "his heart was overcharged to express." The young apprentice (safe in innocence) ventured, with some of the worst, to the principal. "Then and there was

hurrying to and fro." "Who mixes the silver?" "Has anyone been inventing anything?" Questions like these were rapidly asked and as rapidly disposed of, resulting in the despatch of a telegram for different paper. For a while all went well, till the sample lot was used, and a new ream opened. "Any spots?" were the words that trembled on our lips next morning. "Just the same," was the dreaded answer. Time went on; various theories were mooted and freely discussed. "It is the spray sparkling on the prints directly they are placed in the trough." "No; it is that new sensitizing room—something comes from the plaster and spoils the paper." This last was indeed very feasible, for we well knew that a newly-plastered room, for evident chemical reasons, is not the place to dry sensitized paper. For awhile this put us off the right track, till getting the same spots on resorting to our old room proved it was not the cause. We then determined at every printing to use principally paper that had never troubled us, along with pieces of spotty, previously marked, and prepared and finished in different ways.

Then ("twas passing strange!"), do what we would, we could not produce a spot. This was rather annoying—all our tests, of course, went for nothing. This was the case during some very dull weather, with fewer prints than usual, which gave us the first glimpse of the cause of our trouble. Directly the weather changed, and the number of prints increased, the spots broke out.

The question now arose, "What was the difference in treatment of a small and a large batch of prints?" It was then we came to the glaring fact, that the paper received from a well-known, old-established firm could not survive even a couple of minutes over a certain time of immersion in the hypo solution. The largest batches of prints were, in our practice, left a little longer in the hypo than the others, and this was found to be the cause of the spots. If prints from this particular paper (which probably is now in general use) remain in the hypo (say) ten minutes, no spots will result; but two or three minutes more, and spots will appear while in the washing trough, and with still longer immersion they will gradually gather while looking at them in the hypo.

While recognising the great importance of the fixing of prints (which ought to be gauged as accurately as any operation in photography), yet there is no reason why such penalties should ensue by overstepping the time of immersion, and albumenizers should see to it that no paper is sent out but will admit of some latitude.

A MONSTER PHOTOGRAPH.—The *Philadelphia Ledger* describes a photograph of the exhibition grounds, which is probably the largest photograph on a single sheet of paper in the world. It was produced by Mr. F. Gutekunst. The sheet of paper on which it is printed is ten feet long, and eighteen inches wide, and special baths for the silvering and toning of this large sheet had to be made. The difficulty in the way of printing a picture of this size from seven negatives on a continuous sheet of paper is very great. The whole sheet must first be silvered. A section of it is exposed under one negative until printed, and then a second section is printed, and so on until the picture has been completed. The lines of the picture (parts of which may be found on two negatives) must be accurately joined—no double exposure can be permitted, else a dark line will show the junction of two negatives—and, finally, each of the seven prints must be made of the same depth of colour. This is largely a matter of judgment, for the pictures are always printed much darker than they are intended to appear when finished, and the time of exposure affords no certain guide to the depth of colour, because the degree and power of light change with every passing cloud and with every hour of the day. But after the printing has been completed the "toning" with gold must also be evenly done, else the blacks will be of a bluish cast in one part of the picture, and of a red tone in another part. It is, besides, extremely difficult to handle such a large sheet of paper as it passes wet through the washing processes, the toning and fixing baths, &c. There is scarcely a trace of the junction of prints, and the whole picture is uniform in colour and tone.

The Photographic News.

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THE CARBON DISCUSSION.

THE discussion on the carbon process at the meeting of the Photographic Society, on Tuesday evening last, would probably disappoint many. There can be no doubt the subject is one of rapidly-increasing interest. The possible necessity of taking up the process for professional purposes is a question which all photographic portraitists of position feel bound to consider. Some few try to ignore the necessity at all; others are satisfied that they need not be uneasy at present; but the most enterprising are earnestly enquiring how they may best overcome the confessed difficulties, and get into smooth working order with the least risk and sacrifice. This question was not answered on Tuesday night. The discussion scarcely, indeed, touched technical questions at all; there was certainly no debate on many of the points of difficulty of which these in their carbon novitiate often complain.

But, whilst the discussion was less comprehensive and less technical than might have been anticipated or desired, it was in some aspects very interesting and encouraging. The especial qualification for giving an opinion of weight on such an occasion is experience, and the experience brought before the members was of an essentially encouraging character. Mr. Baden-Pritchard, superintendent of the photographic department at the Royal Arsenal, stated that they had worked the process in his department with satisfaction for seven years, and had, during that time, turned out upwards of a hundred thousand large prints, using the process as it was introduced by Swan and Johnson. The excellence of the prints exhibited gave the greatest value to this testimony.

The next definite expression of experience was that of Mr. Hughes. This was especially interesting, inasmuch as some time ago Mr. Hughes announced that he had definitely given up silver printing, and banished it and all its belongings from his establishment; carbon alone being employed in printing the pictures of an extensive business in portraiture. After a time rumours began to circulate that carbon had broken down in Mr. Hughes' establishment, and, of course, many amiable chuckles were indulged in by those who had been too wise to try it. The statement of experience from Mr. Hughes was, therefore, the more interesting and startling. He stood up in the meeting on Tuesday evening as the most uncompromising advocate of carbon who has ever before spoken on the subject. It was true that there had come troubles, unexpected, and temporarily baffling, but not inherent, and he had for a time had to resume the use of silver. Strangely enough, this return to silver produced no renewed love of the process or its results. He had never before felt so much disgust to silver printing as he did on

trying it again after twelve months' working of carbon. He now avowed his conviction that the sole difficulty in the way of working carbon was inexperience. He strongly confirmed the view we recently expressed as to the folly of any man believing that because he was a photographer he ought to be able to practice a new mode of working without going through the process of learning it. At one time he, like many beginners, complained of bad tissue and other materials. Now he knew it was bad manipulation. At one time he thought carbon could produce, with special negatives taken to suit the process, as good prints as silver. Now he knew that, with any negative, carbon could produce better prints than the best silver prints from the same negative. This is, doubtless, very strong speaking; and probably but few in the photographic community will endorse the opinion. But it must be remembered that it is based upon a trial very few have made, as experience that, perhaps, none other has gone through, and is, unquestionably, worthy of grave attention.

The one technical question which was brought before the meeting was not really discussed. Mr. Pritchard, in a brief paper, examined the common defect of carbon prints, reticulation in the material forming the image. Mr. Pritchard found that the defect could be produced by excessive desiccation of the sensitive tissue; and Mr. Sawyer's experience, that it could be produced by over rapid drying, and prevented by slow drying, was practically a confirmation of Mr. Pritchard's position. But the *dernier mot* on this subject of reticulation has not been spoken. From the various examples which have come under our attention, we fear that all the forms of reticulation and all its causes are not covered by these explanations. In the experience of Mr. Woodbury, in producing his reliefs with bichromated gelatine, the addition of some kinds of pigment produces a granulated reticulation. In the early experience of the old photo-engravers—amongst whom we may name Paul Pretsch, Dallas, and others, whose effort it was to get their exposed film of bichromated gelatine to dry with a reticulated grain as a matter of much importance in their process—one difficulty was that this reticulation always appeared with some samples of gelatine and not with others. The Autotype Company, as manufacturers of the patent tissue, have doubtless given, as it has been their interest to do, careful attention to the matter. But it cannot be undesirable, not the less, that experimenters adopt Captain Abney's advice, and in their experiments try the effect of differently-prepared tissues. In some experiments, limited by our journalistic engagements, which we tried some time ago, we found the thickness of the film of gelatine an important factor in the matter, a thick film, requiring long hanging before it was dry, always reticulating; whilst a thin film, which rapidly dried, was almost invariably free from this defect. Impure air, long keeping of the sensitive tissue, its momentary exposure to light; indeed, any cause which produced a thin, insoluble film on the surface of the tissue, incapable of expanding when the gelatine underneath it expands on immersion in the water—all these things tend, in our experience, to produce reticulation.* Other causes and cures have been recently suggested in our pages, which we cannot discuss now.

We may, in conclusion, remark that other and more technical discussions on carbon are desirable, and would doubtless prove instructive to many anxious to learn.

PRIZES AT THE EDINBURGH EXHIBITION.

NOTWITHSTANDING the controversy evoked by the determination to give medals at their exhibition on its first announcement, it is probable, we think, that the issue will give general satisfaction. In the award of such a

* Since this article was in type we have received a letter from Mr. Spenser on this subject, which seems to be in harmony with the views we have expressed.—[Ed.]

large number of prizes, after the wearying examination of such a large collection of competing pictures, it would be strange if some of the decisions were not open to challenge. There will be inevitably many disappointed competitors, who lose no honour, however, by failure, and whose work is of the highest order; but there will be none, we hope, who will challenge the decisions of the jury as either incapable or partial in their judgment. The gentlemen forming the jury of award appear to have been selected on the same principle as those composing the jury in the Crawshaw awards. In that jury was an Associate of the Royal Academy, a professional photographer, an amateur photographer, a photographic journalist, and the secretary and president of the Photographic Society, thus securing various forms of cultivated judgment. The Edinburgh jury consists of two artists, two professional photographers and an amateur photographer Sir Daniel Macnee, President of the Royal Scottish Academy, and Norman Macbeth, an Associate of the same Academy. The photographers consist of well-known men. Mr. Rodgers, of St. Andrew's, is one of the oldest of photographic portraitists, and old photographers remember that, so long as twenty years ago, Mr. Rodgers' portraits were the wonder and envy of the profession throughout the country. Mr. Annan, of Glasgow, is also well known to all photographers for the excellence of his work. Mr. Lessels, an architect and amateur photographer, is president of the Edinburgh Photographic Society. Technical knowledge, artistic judgment, and high standing were thus combined in the jury. Some of the awards and some of the omissions will doubtless create surprise—indeed, have done so already; but, on the whole, we are satisfied that the bulk of the medals are fairly earned, and will give general satisfaction. It will be seen from the report of the judges, which we print on another page, that the gold medal is awarded to a foreigner, M. Kareline, a Russian artist, obtaining it for portraiture. As this medal is awarded for "the picture which possesses the highest degree of merit, irrespective of size or subject," the award is a high honour, and furnishes an interesting commentary on the fact that at the American International Exhibition six medals were awarded to the only six Russian photographers who contributed to the exhibition. The medal for the best enamel was also awarded to a Continental artist. We may, in connection with this award, express a feeling of regret that some of the most able photographic ceramists in this country failed to contribute. The awards, generally, are well distributed amongst Scotchmen and Englishmen, and we may mention that it should be remembered, in connection with the awards, that a large number of fine pictures were exhibited which were marked "not for competition."

Critical Notices.

FAMILIAR LETTERS ON SOME MYSTERIES OF NATURE AND DISCOVERIES IN SCIENCE.
By DR. T. L. PHIPSON. (London: SAMPSON LOW and Co., 1876.)

THIS is a new and interesting work from the pen of a gentleman well known in the scientific world, who has been long familiar to our readers as English correspondent of the *Moniteur de la Photographie*. It consists of fourteen letters, which treat of the following subjects:—The *Ignis fatuus*, or Will-o'-the-Wisp; Electric Fogs; the Chemistry of the Ocean; the Science of Sleep, Somnambulism, and Anæsthesia; the Marvels of Electricity applied; Plant Motion; Firestones; Observations and Experiments connected with Atmospheric Electricity; Lightning Prints; Earthquakes; Luminous Animals; Aërolites; Life on the Earth; and Inhabited Planets.

Though written in a familiar style, these letters contain

many original observations and carefully historical details, so that the work will prove, we doubt not, as acceptable to the student and man of science as to the general public. It contains some very curious pages on certain luminous phenomena, and a complete account of the rise and development of electrical observations. As it is sure to be widely read, we need not do more than allude to it here.

SCIENCE LECTURES AT SOUTH KENSINGTON: PHOTOGRAPHY. By CAPTAIN ABNEY, R.E., F.R.S. (London: MACMILLAN and Co.)

THERE is probably no other book in existence in which the reader would obtain an account so brief, so lucid, and so comprehensive of the history and technics of photography as we find in the two lectures delivered by Captain Abney at South Kensington. Within a space of thirty-two pages every event and every detail of importance of the early history and progress of photography, including its latest phases, is given, forming a compendium as interesting to the general reader as to the photographer.

THE PHOTOGRAPHER'S ALMANAC, 1877. (D. H. CUSSENS, Southport.)

MR. CUSSENS again issues his useful little pocket almanac for photographers. Besides a calendar, &c., it contains two Woodburytype prints, illustrating some admirable accessories for the studio.

Correspondence.

VARNISHING TRANSPARENCIES.

DEAR SIR,—Your reply to "R. G.," in this day's PHOTOGRAPHIC NEWS, might mislead him or her, and many others. In my own experience I find that it is *absolutely necessary* to varnish collodion transparencies, if they are to be placed in a window in London, at least. Believing at one time as you evidently do now, I fitted some transparencies unvarnished into a window about three years ago; all those that I varnished are as perfect as they were at first, while the unvarnished ones have *sulphuretted*, and gone all round the edges, much as a Daguerreotype oxidizes when exposed to the atmosphere; but they are not cleanable like Daguerreotypes.—Yours truly,

J. WERGE.

11a, Berners Street, January 5th.

[Unless the transparency be sealed up perfectly between the glasses, it will doubtless quickly suffer in the impure atmosphere of large towns. It will, probably, be wise to be guided by Mr. Werge's experience, and varnish either with a cold "crystal" varnish or spirit varnish.—ED.]

MICRO-PHOTOGRAPHY FOR GENERAL USE.

"That place that does
Contain my books, the best companions, is
To me a glorious court, where hourly I
Converse with the old sages and philosophers;
And sometimes, for variety, I confer
With kings and emperors, and weigh their counsels:
Calling their victories, if unjustly got,
Unto a strict account; and in my fancy
Deface their ill-placed statues. Can I then
Part with such constant pleasures to embrace
Uncertain vanities?"

DEAR SIR,—In your last issue the article on "Micro-Photography for General Use" strikes me as being very Utopian, and its scheme quite as impossible now as it was seventeen years ago. In an extreme case like the siege of Paris I grant it may be—indeed, has been—turned to account; but can you imagine a student or literary man seeking his knowledge from a series of tiny rolls with a microscope?

Some ancient rolls are still shown, I believe, in the Jewish Synagogue at Hebron, but this mode of keeping

manuscripts was discarded about the year one, that is to say, nearly nineteen centuries ago. They were usually written on parchment, with the columns of reading perpendicular to the length of the roll. The ancient Greeks, and, before them, the Egyptians, had the same method, the latter people using papyrus on which to inscribe their characters; so that these rolls were in fashion when the pyramids were building. Fancy an encyclopædia, or other large work of reference (and these are specially named in the article I am criticising), being put into a roll or scroll, and you wish to consult an article under the letter A, when you find the preceding reference, made one minute before, perhaps, was at the other end of the alphabet! What an unwinding and winding up there would be! The author says, "Micro-photography will not, of course, supersede ordinary printing." I should think not. Who would like to read a micro-photographic reproduction of any author's original manuscript? Then, as to the very small cost of these tiny tomes, or volumes rather: if a rare and valuable work is to be photographed, two copies of such work must be pulled to pieces for copying purposes (for you cannot copy both sides of a leaf at once, and the pages must run consecutively in the roll), and probably they would have to be bleached and rotted to make them available for photographic purposes. Who, I ask, would trust his precious folios, quartos, or duodecimos, to undergo such usage? No doubt it would be very pleasant for the studious man to be able to carry about with him a complete library in his travelling-bag.

"The assembled souls of all that men hold wise!"

(though it might be difficult to enjoy in a railway carriage) and to get his *Times* roll with the other rolls at breakfast. But, joking apart, I am quite of the proposer's own opinion where, in his curious last paragraph, he says, "there are very great difficulties in the way of carrying out this project;" and it will be a long, long time before book-worms are seen coveting and bidding against each other for a tall copy (say two inches) of an early black-letter book "emprynted" by Caxton, Wynkyn de Worde, Tottell, or some other old typographer, and done in micro-photography and rolled round two sticks!—I am, dear sir, yours very truly,

RICHARD KEENE.

Derby, January 9th.

FILTERING PAPERS.

SIR,—As you surmise, the filtering papers introduced at Paris, and referred to in your last issue, are not new. Many years ago the late Dr. Lotheby taught his practical chemistry class the same way of making them.—Yours faithfully,

A. A. MANTELL, M.D.

CARBON PRINTING.

SIR,—“A Carbon Experimentalist” has replied to my letter. He asked for information, and he received more than he asked for. Still he is not happy, for he abuses me. The writer had asked for information as to the size and number of tanks and dishes that were necessary for carbon printing in a small commercial business. I replied that there is no common agreement among carbon printers on this subject. The knowledge how to work the process suggests to each one how he can best carry it out to suit his own wants. I said, further, that the mere inquiry for this knowledge showed that the writer wanted something of far more importance—the knowledge of how to profitably use the tanks and dishes. I recommended the writer to get such solid information, which obtained, the rest would follow as a matter of course. I therefore suggested to him that he should not fritter away his time by writing anonymous letters, but go to head-quarters, pay an honest fee for the instruction, see the work done, and go and do it himself.

For giving this advice, which I still feel to be the very best that could be given, I am abused and called a “trot-

for the Autotype Company, and the Company are called upon to repudiate this advice. I referred to “head-quarters,” because I know no other means by which this valuable information can be so satisfactorily obtained; and I recommended that an “honest fee” should be paid, because I thought that no reasonable man would expect to receive practical instruction without giving an equivalent. This correspondent is also annoyed that I allude to him as being “anonymous.” When a gentleman makes a request and signs his name, as Mr. Robinson did recently, the communication is regarded in quite a different light to that of an anonymous correspondent. But the real offence that I seem to have given to “A Carbon Experimentalist” is in recommending him to pay “an honest fee,” for he alludes to it several times in his letter. Is a “Carbon Experimentalist” one of those who wish to obtain information, which, as a business man, he will hope to turn into money, and yet objects to pay “an honest fee” for it? And does he, by concealing his name, wish to get it, not only on the cheap, but also on the sly, so that he may possibly use it to the detriment of the man who gave it?

A SUCCESSFUL WORKER.

THE DISCUSSION ON CARBON PRINTING.

DEAR SIR,—With reference to the discussion upon “Carbon Printing” at the meeting of the Photographic Society on Tuesday evening, there are one or two remarks upon the subject of “reticulation” of the tissue, which I should like to offer.

It was shown by more than one speaker how the effect of reticulation could be produced, but little was said explanatory of the cause of it. The subject is, perhaps, not yet fully understood, but the observations of M. Placet may throw some light upon it indirectly. He noted that when a film or sheet of gelatine is immersed in a solution which has a tendency to dissolve it, and afterwards into a second solution having a tanning or contracting property, the whole surface is covered with a “grain,” caused by the contraction it has undergone. He notes that the characteristics of the grain, as to thickness, form, and depth, vary according to the nature of the gelatine or other organic substance, and the liquid employed. Upon his observations he based a process of engraving by photography, for which he took out a patent in 1874.

We can readily imagine that when a streaky tissue is immersed in a solution of bichromate, especially in hot weather, or when the gelatine employed has been in a somewhat too soluble condition, the action of heated air (which always has a tendency to produce insolubility in bichromated gelatine, whether mixed with pigment or not) will, by inducing an insolubility of the surface produce the “contraction” referred to by M. Placet, and which is virtually the “reticulation” so annoying to the carbon printer.

Rapid drying was noted as one of the means of producing this effect, and if this refers to drying by heat, I fully agree with the statement; but I have met with many tissues very rapidly dried by means of cool, dry air, which have shown no tendency to exhibit this phenomenon.—Very faithfully yours,

JOHN A. SPENCER.

9, Grafton Road, West Kensington, Jan. 10th.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held on the evening of the 9th instant, in the Water Colour Gallery, Pall Mall, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed.

THE CHAIRMAN called attention to the fact, that at the next meeting, in accordance with the laws, the president, one vice-president, the treasurer, and six members of council would retire from office. Members might nominate candidates, and the

balloting papers would duly reach every member. The retiring members of council were Mr. Francis Bedford, Major Malcolm, Mr. Stillman, Mr. Howard, Mr. Bird, and Mr. Hughes.

Mr. S. FRY then briefly opened the discussion on carbon printing. He referred to the prevalent instability of silver prints, and to the fact that this instability, instead of becoming rarer, seemed to be more prevalent. Carbon printing, on the other hand, had steadily been progressing, and, thanks to the method of working introduced by M. Lambert, was now a practical and possible process for the photographic portraitist to undertake. In witness of this position, he showed a large number of choice prints taken at random out of the regular produce of one gentleman who worked it regularly, Mr. Sachs, of Halifax. He also showed some transparencies produced by himself in carbon for producing enlarged negatives.

Mr. H. BADEN PRITCHARD exhibited a number of large carbon prints produced at the Royal Arsenal, Woolwich. He said they had been working the carbon process pure and simple for about seven years at Woolwich, and during that time they had produced not less than a hundred thousand prints, of the character of those before the meeting. The method they used was that introduced by Swan and Johnson, and they had not felt it necessary to adopt the recent modifications of M. Lambert. Mr. Pritchard then read a paper on Reticulation in Carbon Prints, in which he attributed the tendency to reticulation to excessive desiccation of the tissue.

The CHAIRMAN read a note from Col. Stuart Wortley, regretting his inability to be present (Col. Wortley was laid up with a broken rib and other injuries incurred in the late Arlsey collision). He stated that he had worked the Lambertype process for some time with great satisfaction.

Mr. JAMES HUGHES had been an ardent worker of the carbon process for about ten years, but it had only been comparatively recently that he had been able to work to his complete satisfaction, so as to adopt it as a substitute for silver printing. The condition he had always laid down for himself was that the process, besides being practical, should, in all respects, produce pictures equal to those produced by silver. However permanent, if it had not been beautiful, he was not prepared to accept it. In this respect it must, at least, reach the level of silver, or he would not recognise it as a legitimate substitute. The process had reached that stage. It had become practical, and the results were beautiful, and he had been one of the first to embark in its constant working. In his estimation M. Lambert was unquestionably the introducer of carbon printing into practical use in this country. When he saw this clever manipulator he was charmed by his working, and by his success when working under all kinds of difficulties. He was working from home, with other people's negatives, under all kinds of unfamiliar conditions, and yet he succeeded perfectly. Well, he adopted the process, and he gave up silver entirely, working only carbon. This went on for twelve months. Then there came some troubles into which he need not enter—but the hot weather was one of them—and he felt it necessary to resume silver. Well, if there was one thing more than another which disgusted him with silver, it was the return to its use; and he felt satisfied that only an increase of knowledge and experience in working carbon was necessary to banish silver altogether. But patience and perseverance there must be to overcome, not the difficulties of carbon printing, but its special peculiarities. One of the Editors had recently pertinently remarked that many photographers seemed to think that the mere fact of being photographers gave them some special qualification for practising carbon printing without learning it as a new business. Many of them had without a doubt acted in this spirit, and taken it for granted that the process must be wrong if they could not work it successfully at once. The truth was that previous knowledge in photography practically went for nothing. Some of those present were in their third apprenticeship in photography. In the early days of some present, the Daguerreotype process alone prevailed for portraiture. Then came collodion, and it was found that a very perfect knowledge of the Daguerreotype process was very little help to practising the collodion process. Indeed it often happened that the men not hampered by previous experience and traditions of another process succeeded best with the new process. So it was with old photographers and the carbon process. They were apt to regard tissue as a kind of inferior albumenized paper, to be dealt with in manner similar; and it had not received that attention which it required, and which it demanded as a condition of success. He wished earnestly to impress upon all working in

this direction—and he urged it for consolation as much as for guidance—that the common charge of “bad tissue” was a huge mistake, and, properly interpreted, meant simply want of experience and bad manipulation. Let them constantly bear in mind, when talking of difficulties, that the chief difficulties were want of knowledge and want of experience. Twelve months ago he believed that carbon wanted humouring, and that special negatives were necessary. Now he was convinced that carbon would produce from any negative a finer picture in every respect than the best silver print from the same negative. This was the result of his experience and observation; this being so, he felt that the public had a right to expect that photographers would furnish them with permanent pictures.

Captain ABNEY, as a carbon worker for seven years past, felt that one of the principal difficulties was not knowing the materials he was working with. He did not know how the tissue was made, nor what it was made of; and he felt that in working out a novel process such a knowledge was desirable. He would recommend experimentalists to prepare materials for themselves, and by different kinds of tissue so made they would gradually acquire some real notion of the carbon process and its requirements.

Mr. F. BEDFORD asked if the gloss he saw on the various specimens was a necessity, or an attempt to imitate albumenized paper. He thought it was in bad taste, as a fine matt surface was more artistic, especially in large work. The glaze was admissible, he thought, in small work.

Mr. PRITCHARD explained that it was not necessary; but that his men thought it the right thing, and they used their zinc plates highly polished.

Mr. HUGHES said that carbon printing admitted of every surface, from perfectly matt to the highest glaze. Popular taste at present went in for the glaze.

Mr. F. HOWARD mentioned the experiments of Mr. Blanchard and others in treating silver prints with collodion, and pointed out that such prints, so treated, showed no sign of change.

Mr. BLANCHARD said that small pictures required finer finish than large ones, and the practice of enamelling the surface gave small pictures the effect of finish. There was one point, he thought, important to notice. Modern carbon prints frequently looked heavy and dull in the shadows, whilst many of Mr. Swan's early prints were free from that fault. He thought this was due to the attempt to imitate the tone of silver prints, which rendered necessary the use of a large proportion of transparent pigment. A smaller proportion of an opaque pigment would give, he thought, a better effect, as giving a surface more perfectly reflecting back the light. He based this idea upon the reflecting qualities of water-colour drawings and Daguerreotypes.

Mr. SAWYER said that in regard to those who might be disposed to take Captain Abney's advice, and make their own tissue, he could promise an addition to their troubles they little dreamed of. He would advise them, on the contrary, to purchase in small quantities, and test carefully. He could assure them that to make a good tissue required an amount of experience not quickly gained. As to Mr. Blanchard's suggestion, he would consider it; so far as his experience went, he did not think the result would be in accordance with Mr. Blanchard's idea. In the tissue made for reproductions of engravings, a small quantity of opaque pigment was used, but no additional luminous quality was produced. The Company was, he hoped, progressive in all its work, and they were constantly striving to improve their tissue. Regarding reticulation, they could produce or prevent it at will with the same tissue. It was a matter quite in the hands of the operator. If a sensitized tissue were placed in a room to dry at a temperature which would require seven or eight hours for drying, the tissue would work without reticulation. If precisely the same sensitive tissue were placed where it would dry in half that time it would reticulate. A piece of tissue sensitized, then divided and submitted to these two modes of drying, then joined, exposed on the same negative, and developed together, would give, in one half, reticulation, and in the other, perfect freedom from it. He then referred to the troubles of silver printing during many years, and pointed out that the greatest difficulty of carbon printing were not more formidable than those attending silver printing in its early days.

Captain ABNEY said he did not recommend photographers to make their own tissue, except for experimental purposes. He thought the remarks Mr. Sawyer had made furnished the strongest confirmation of the propriety of his advice.

The CHAIRMAN commented on the interest and desirability of

the discussion, adding his testimony to the wisdom of obtaining and paying for lessons from experienced men. He (after proposing a vote of thanks) announced that a paper would be read at the next meeting, which would be partially devoted to business, partly to a paper on Photography from a Holiday-maker's Point of View, by Mr. H. Baden Pritchard. At the March meeting the Silver Bath and its Troubles would be discussed, when he hoped they would have the assistance of Col. Stuart Wortley to take part in the proceedings.

The meeting was then adjourned until Feb. 13th.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of the Society was held in 5, St. Andrew's Square, on Wednesday morning, the 8th inst., the President, Mr. LESSELS, in the chair.

The minutes of last general meeting were read and approved, and Messrs. James K. Brown, John Howie, John Houlden, George Mason, Thomas R. Rodger, Jun., James Anderson, Alexander Dinnie, M. Macpherson, George Cheyne, R. Anderson, R. Middlemas, J. Geddes, Edwin Smithells, and David Gregg, were admitted ordinary members.

The Council reported that they had considered the remit made at last ordinary meeting, and begged to recommend that a presentation picture be given to the members, to be printed by one or other of the carbon processes from a negative to be selected from the pictures at present on Exhibition.

After considerable discussion, it was resolved to select one picture, and that the selection be left to the Council, the members of which were requested to enter the name and catalogue number in a book provided for the purpose, to be found on the Superintendent's table in the galleries. It was also resolved that two other pictures be selected in the same way, and supplied to subscribers at such prices as might be arranged by the Exhibition Committee.

Messrs. KEMP and Co. then exhibited an improved sciopticon, which was explained by Mr. Bashford, who used it to show a number of very fine transparencies of physiological, botanical, and mechanical subjects sent by Herr Ganz, of Brussels. The improvement claimed for the sciopticon in question is the absence of the dark line generally present on the disk of the original instrument. A number of very beautiful pictures contributed by Mr. Pillans were then distributed by lot, and after the usual votes of thanks the meeting was adjourned.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held on Wednesday, January 3rd, at the Museum, Queen's Road, Bristol, Mr. P. J. WORSLEY, F.C.S., one of the vice-presidents, in the chair. The minutes of the previous meeting having been read by the Secretary and confirmed,

The SECRETARY handed round some pocket almanacs sent for the members by Messrs. Cussons and Co., of Southport.

Mr. DANIEL proposed, and Lieut. LYSAGHT seconded, Mr. Aldridge, of Bristol, as an ordinary member, who was forthwith elected. Messrs. Webber, Boyden, and Strachn, were elected members of council.

The CHAIRMAN then called upon Mr. H. A. H. Daniel to read his paper on "Light, Exposure, and Development" (see page 16), after which

Lieut. LYSAGHT spoke of the shutter mentioned by Mr. Daniel as not of recent introduction, being brought out by Canon Beechey some few years since.

The CHAIRMAN considered it far more advisable to get the clouds from a separate negative.

Mr. BRIGHTMAN spoke of a remark of Mr. Daniel's, as to the discolouration of Canada balsam in lenses as caused by light, and rather doubted it, and which, he thought, was pretty well proved when he once bought an old lens at a second-hand bookstall, the cement of which had greatly changed colour, but the rim of the cell had quite covered one part of the balsam, which was quite as much discoloured as that fully exposed.

Lieut. LYSAGHT upheld Mr. Daniel's assertion relative to the discolouration of the balsam often in careless eyes condemning a lens, and instanced the case of a friend of his who bought for very little money an apparently discoloured lens, when it turned out to be only the cement which was discoloured, the lens being a very fine one.

The CHAIRMAN drew attention to the very different colours different kinds of glass would turn.

Mr. DANIEL reverted to his statement relative to the assistance to development that pouring the developer off the plate for a few seconds gave, and hoped some present might throw some light on the subject.

The CHAIRMAN suggested that when the quantity of developer on the plate was reduced, as it were, simply to a thin film, the temperature of it might be raised, thereby causing the result spoken of, although quantity did not, as a rule, affect chemical action.

Lieut. LYSAGHT asked what was the result of a mixture of loaf sugar and nitrate of silver.

The CHAIRMAN said that he was not aware of any compound that would be formed thereby; certainly nothing perceptible.

Mr. WEBBER enquired the object of adding loaf sugar to the nitrate bath.

Mr. DANIEL said that he found a good sized lump very useful in causing the plate to keep moist longer, and so facilitate the production of clean negatives.

After some further discussion on the use of boracic and acetic acids in the negative bath, and a vote of thanks to Mr. Daniel for his paper, proposed by the Chairman and seconded by Mr. Webber, the meeting was adjourned.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held on the 1st inst., M PELIGOT, President, in the chair.

M. PERROT DE CHAUMEUX called attention to the process of Mr. Ernest Edwards, of printing upon fabrics by means of aqueous solutions, a block being employed for the purpose, something after the manner of the Lichtdruck process; the absorbent portions, and not the non-absorbent portions, of the gelatine being, however, made use of to convey the impression.

M. LIMOUSIN showed a specimen of *glasvolle*, a material little known in France, and which was employed in Germany and Austria particularly for the filtration of liquids. He read a short note on the subject (in our next).

M. JULES GIRARD gave an account of his continued research with the microscope, and especially in connection with the phenomenon usually termed fogging.

M. PERROT DE CHAUMEUX presented the Society, in the name of the author, with a little volume entitled "Les Couleurs Reproduites en Photographie." It conveyed a description of the process of M. Ducos du Hauron, that gentleman having collected and re-edited the papers already written by himself, and issued them in this collective form.

The members then proceeded to the election of the jury of awards for the forthcoming year; the gentlemen chosen being MM. Andra, Becquerel, Chardon, Davanae, Ferrier, A. Girard, and Peligot.

M. ALFRED CHARDON exhibited some prints produced by a process modified by himself.

M. ROUSSELOU showed a photo-mechanical print produced in the printing press, which was stated to be the first specimen of its kind, namely, a photograph in half tones from nature pulled from a printing press. M. Rousselou believed the result would have been much more satisfactory had it been produced by a skilled printer.

M. ROUSSELOU also showed some specimens of photo-engraving.

M. KLERJOT, representing M. Ducos du Hauron, gave a demonstration of the latter's process. He commenced by exhibiting three *cliches* secured through the coloured screens, and then showed three monochrome prints in red, yellow, and blue obtained therefrom. The yellow and blue superposed yielded the greens of the picture, and on the addition of red the image was complete. The result created some surprise among the members.

The proceedings then terminated.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.*

The usual monthly meeting was held November 8th, the President, H. J. NEWTON, in the chair.

The minutes of the last meeting were read and approved.

Mr. D. C. CHAPMAN said that Mr. H. T. Anthony showed him, during the week, some prints which he had recently made, and that there seemed to be some peculiarities about the colour of the negative which appeared to give a better tone to the paper prints than negatives of any other colour. He asked him if he

* Condensed from *Anthony's Bulletin*.

did not think a peculiar opacity of lights and shades in the film would not produce the same.

Two negatives with the same opacity will give quite different prints; one set will tone easier and much better than the other. This is due to the colour of the negatives. Now the question comes up, whether the colour of the negative affects the wave lengths of light on the paper; whether these going through a certain colour, changing the wave length, will not give a more pleasing tone than waves of another length. Thus sepia seemed to communicate a peculiarly pleasing character to the picture. Now, suppose we have a blue negative, all the light passing through that is blue light; and whether it is the wave length that does the work or the peculiar condition of the silver salts is a question. If we take paper and print it under red glass and then under ultramarine blue, the wave length of light in one case is nearly double the length of the other. Does this difference produce variation in the silver salt sufficiently to affect the tone of the picture?

The SECRETARY remarked that this was a pretty close calculation, and involved a problem most difficult to solve. The paper is under the negative only a short time; but under orange or red it is necessary to expose the paper a long time. A sensitive paper is subject to other influences besides the actinic light. And it is a very sharp point to demonstrate whether it is the length of exposure or the wave length which causes the variation. If it passes through a sepia negative, the action is comparatively slower. Prints taken from the same negatives in sunlight and in shade often have a very different tone.

Mr. CHAPMAN inquired whether it was the length of time or the wave length that does the work?

The PRESIDENT remarked that several years ago he experimented considerably with colouring negatives. He thought there could be no question but that different coloured negatives made prints which would give different tones, other conditions being equal. He used aniline colours in the varnish to produce the different shades. A deep purple varnish was the one which gave the most pleasing results, and it was adopted at that time by quite a number of our photographers.

The SECRETARY asked the President if he had ever given them a formula for the ground glass substitute?

The PRESIDENT replied that there was one similar to his, published, he thought, in the *Boston Journal of Chemistry*. Some one saw it and put it in the market as a secret preparation. The ingredients are benzole and ether, with either gum sandarac or gum dammar. He usually used gum sandarac. He found that a little alcohol would make it work finer; with it you can grade it to any degree of fineness you desire. The formula which he used is:—

Ether	..	...	...	...	4 ounces
Benzole	...	...	...	...	2 "
Alcohol	...	...	...	...	½ ounce

The gum is added from ten to twenty-five grains to the ounce. Care should be taken not to use too much alcohol, which would give a transparent instead of a ground glass effect. In using this preparation, the result is the same as in printing by diffused light.

The SECRETARY asked if heat was used in applying this preparation?

The PRESIDENT replied, no; it dries in the air without artificial heat and very quickly. He had frequently, in preparing a negative where the sky was thin, used what is called in the trade opaque on this surface; and by rubbing off portions of this you can make clouds to suit your taste.

Mr. CHAPMAN said that much was said of the durability of carbon prints. Now, do not our albumen prints last just as long as we want them? What is the use of having something that will not benefit the operator or his customers? He was pretty well satisfied that in the majority of cases it is found that as fashion changes new pictures will be taken. A change of fashion involves a change of dress; and people are anxious to see how they look in new costumes, and hence new pictures are desired. If all the pictures that Mr. Kurtz has taken of wealthy people were preserved, how seldom would he have to repeat them! The old negatives would not suit a new style of head gear. The carbon process may be valuable in showing the growth of a child, and in that case the first picture should be durable. Every photographer who does a general portrait business can usually judge whether a person wants a dress or a face taken. That class of people who care most for dress do not care for a carbon print. The majority of silver prints will last as long as needed; histo-

rical and astronomical, and such matters as require to be kept on record, would give way to the carbon process; but as to its introduction into galleries, he did not think the photographer or the public wanted it. Those who want to preserve their pictures are but few.

Mr. A. BROOKES desired some pictures copied by the carbon process, and he was told they would be more expensive.

The PRESIDENT said it was evident that carbon prints would be more expensive than silver ones. From a financial point of view, the photographer does not look with favour on the carbon process; that, at least, was his inference. Whether, however, it would be for the pecuniary benefit of photographers in the long run to have it generally understood by their customers that the prints they furnished them would become worthless in a few months, is a question which could be easily settled without discussion. He said he did not think it fully settled that silver prints could not be made as durable as carbon ones. The testimony of some, at least, in Europe, who have given the carbon process considerable attention, is, that they are not always permanent. Gelatine, which forms the foundation of the carbon picture, bears no comparison to carbon for durability. If the gelatine should decompose, the picture of which it was a component would suffer. He said he had seen silver prints fifteen or twenty years old that had undergone no perceptible change; such prints were not, however, on albumen paper. More care is undoubtedly required to preserve the whites with albumen paper than with plain. Card mounts not unfrequently contain destructive elements.

Mr. WEIL said that bronze is also the occasion of difficulty.

The SECRETARY remarked that he was convinced that atmospheric influences had much to do in producing this effect. Some eight or nine years ago, a friend presented to him some one hundred and fifty or two hundred stereoscopic prints. He left them in his library down town, wrapped in the brown paper in which they came; they were not in a particularly dry place. But last winter, in order to make some changes in his room, he brought them up to his present residence, and examined them. They were as brilliant as on the day they were made; he was surprised to find them in such perfect condition. Some two or three weeks ago he had looked at them, and found that now, in less than a year, they are nearly ruined, while during eight years they were not in the least affected. In the room in which they were formerly kept were hung some steel saws, and they were completely rusted. He kept in the same drawer with them a print which was sent to him about nine years ago to illustrate panoramic work. This was kept in a pasteboard case, and was not affected in the least.

The PRESIDENT said, there are some kinds of atmospheres that photographers work in that is very injurious to their work. He remembered some ten years ago that Mr. Hallett, in the Bowery, sent for him, as he was in trouble. He said that all of his plates came out of the bath with markings in the line of the dip. A new bath would work the same, and he wanted to know if he could divine the cause. As soon as he entered the room, and used his olfactory sense and optics, he at once determined what the matter was. The room was a large one, and the gas was brought from the farthest end, its entire length, to the operating sink, and this gas was carried in a rubber tube. The rubber was vulcanized, and the sulphur of the rubber combined with the hydrogen of the gas. The air was full of it, and this came in contact with the surface of the bath and formed sulphuret of silver there, which made the markings. He advised him to take the rubber down and replace it with iron pipe, which he did, and no further trouble was found.

After some further conversation, the proceedings terminated.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the last meeting of this Society, a large number of lantern transparencies were exhibited by the lime light. The pictures were the works of Messrs. Brooks, York, Fernely, and other members. There was a large attendance of members and their friends.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The *Glasgow Herald* has the following on the Edinburgh Exhibition:—"Under the auspices of the above society an interesting exhibition of photographs was opened towards the end of last week in the National Galleries, Edinburgh. An exhibition of a similar description was held in Edinburgh nearly ten years ago, and

these fortunate enough to have witnessed the pictures on both occasions must have been impressed with the great stride towards perfection in the art of photography which has been made within the decade. As indicating the widespread interest which such an exhibition creates, it may be mentioned that photographers resident in nearly every part of the civilized world have sent specimens of their art to Edinburgh on this occasion. To be specific, there are pictures from India, America, the Bermudas, Germany, Russia, Hungary, Holland, France, Belgium, England, Ireland, Wales, Scotland, and the Isle of Wight and Man. Wandering through the north and south cotages and the rooms included in the National Galleries, one is struck with the large number of exhibits—the catalogue showing the number to be 1,185—the variety of subjects chosen, and the difference in the style adopted by home and foreign artists. The striking peculiarity of the pictures from countries where the atmosphere is clearer and drier than our own is their sharply-defined lines, and the strong lights and shadows which they present. When the subject treated is architecture or sculpture, such conditions of the atmosphere are of great advantage, because by their aid people who have not and cannot have the opportunities of seeing the originals, by looking at the photograph, can get a fair idea of the building or the statue represented. The Eastern collection includes ancient architecture, sculpture, specimens of Babylonian and Assyrian antiquities, &c.; while contributions from artists nearer home include portraits, studies in composition, and views of scenery in this country and on the Continent which have now become familiar to the tourist. Whether the picture be a portrait, a landscape, or composition, the highest excellence is everywhere manifest. Portraits in every style, from the carte-de-visite portrait so common now-a-days to the half-life size in oil, adorn the walls, and bear evidence to the fact that a photographer who knows how to use the material and improved mechanism at his disposal can preserve every lineament of one's features with striking fidelity in the process of enlarging. The result is equally satisfactory when the leafy trees of "bosky dell," or the serrated rocks of a wild glen in the Highlands, is photographed. In short, to the mere onlooker, the exhibition is a most pleasurable one, but to the student of photography it is one of intense interest, because not only has he an opportunity of comparing what has been and what is in photography, but also of seeing and comparing the best work of home and foreign artists. We understand that the exhibition will remain open during the month of January.

EMBELLISHMENT.—A charge of embellishment by a photographer at Hitchin, which we noticed a few weeks ago, was heard before the sessions a few days ago, when the prisoner, W. Allen, was sentenced to three months' hard labour.

ANOTHER SUICIDE WITH CYANIDE.—Dr. Hardwick held an inquest a few days ago, as to the death of Alexander George Lewinton, aged 23, a chemist's assistant. It appeared that deceased was in the service of his uncle, a chemist, in Cleveland Street. On Saturday, between nine and ten, he was found dead in bed, and a breakfast cup which had contained cyanide of potassium was on a table close to the bed. Dr. Nix, Upper Marylebone Street, who was called in, said the death took place four or five hours previously. In the right-hand pocket of deceased's coat he found a bottle containing cyanide of potassium, which had been tested. The case was adjourned for further evidence.

HOT WATERPROOF CEMENT.—The following is a valuable cement which, if properly applied, will be insoluble even in boiling water:—Gelatin, five parts; soluble acid chromate of lime, one part. Cover the broken edges with this, press lightly together, and expose to the sunlight: the effect of the latter being to render the compound insoluble.

To Correspondents

P. S. T.—A detailed account of the gelatin emulsion process will occupy more space than the whole devoted to answering correspondents. You will find many articles in the News and in our Year-Book. In our Year-Book just issued you will find an article by Mr. Kennet giving much information on the subject. If you wish to prepare your own emulsions, see articles in the News of March 16, April 13, June 7 and October 13.

W. H. LONDON.—The reaction which follows the addition of cyanide of potassium to the nitrate bath is a double decomposition in which cyanide of silver and nitrate of potash are formed; the latter, being soluble, remains in solution, whilst the cyanide of silver is thrown down as a white precipitate. When a precipitate is thrown down, other matter in suspension, and sometimes in slight chemical combination, is often thrown down also. There is no reason to fear that any soluble compound of an injurious character will be formed and held in solution in the bath.

M. MARCELIN.—We will endeavour to obtain a copy for you; but we regret that we have not one we can lend. If we obtain a copy we will forward it, and you can forward us the amount in stamps. If you have the back volumes of the News, you will find the process fully described in our Tenth Volume, August 24th, 1866, when it was communicated by Mr. Arthur Taylor, of Marcellin, the originator of the process. In the Year-Book of 1869 it is well described by M. de Constant, who worked the process admirably. Of course albumen will not do in the process, and equally of course the shellac is not soluble in simple water. To an ounce of water add 10 grains of phosphate of soda, 8 grains of borax, and 30 grains of bleached shellac. The mixture is simmered in a pipkin for a couple of hours. This evaporates the solution, which is re-dissolved in another ounce of water. To make it more sensitive, 3 grains of chloride of ammonium may be added; but, if our memory serves us, Mr. Taylor did not use this. Drawing-paper is immersed for half a minute, and when dry floated on a 60-grain silver bath. We have prints of various tones sent us by Mr. Taylor ten years ago, and also by M. de Constant not eight years ago.

X. 304.—The photographs of Mr. Bedford are to be obtained; but we cannot tell you which publisher, as you do not say which series. Probably you will obtain the prints or the information by writing to Mr. Bedford, 336, Camden Road, London, N.W. Mr. Crewdson does not publish his photographs.

F. HUDSON.—Mr. Terry's address is, we believe, 3, Mount Pleasant, Lower Broughton, Manchester. We were sorry to miss your name.

H. K.—The simplest plan for trying the experiment is to obtain an aniline violet dye, say Hoffman's purple. This is soluble in alcohol, and can easily be added to a spirit varnish, which can be applied to the glass.

J. A. B. is not, we presume, a reader of the News, or he would scarcely ask us to give him a "process to prepare a certain, simple, and rapid dry plate of good keeping quality, also means of developing the same." Probably one-eighth of our volume just completed has been devoted, as the numbers were issued from week to week, to the statement and discussion of such processes as he desires. Full details of the coffee process, about which he enquires, have been given in the same volume. That process he will find fully detailed, as well as other dry processes he will find in the Year-Book of PHOTOGRAPHY, just published at our office, price one shilling. As a novice the coffee process will probably suit his purpose well.

A THREE YEARS' SUBSCRIBER asks "if we ever heard it suggested that it might be possible to produce models as perfect as pictures in the camera?" Our correspondent is scarcely explicit enough in his query. What does he mean by "models as perfect as pictures"? An ingenious scheme of photo-sculpture was invented by M. Williams some years ago, and Mr. Woodbury has produced very good bas-reliefs by photography. You will find in the advertising columns of the News and Year-Book the announcements of manufacturers of emulsions. Whether any of them prepare the special formula you require we are uncertain. The cause was probably want of experience. Great care is required, as the plates are very sensitive, and a little carelessness in exposing them to the light, in many dark rooms, will cause fog.

G. W. M.—We have no information on the subject. We do not know of whom the inventor obtained his prism. We should think they could be produced by any glass cutter; but of the price we know nothing. The lower price you mention seems improbably small, and the other immoderately high.

FRED SUMNERSON.—The groups you forward us are very good. A little more sentiment and precision in mounting them are the chief improvements required.

AN OLD HAND.—Many thanks. We shall use some of the copy shortly.

A. L. T. HAARMAN.—Many thanks for your interesting letter and stereographs just arrived. More in our next.

ART PERIODICALS.—A correspondent, whose letter is mislaid, asks which is the best periodical or magazine connected with art. There is no technical journal of an artistic kind at present in existence. There is the *Art Journal*, *The Portfolio*, and other similar journals devoting their attention to subjects connected with art, and giving illustrations of an artistic kind, but not specially writing on points connected with the practice of any of the arts.

Several Correspondents in our next.

The Photographic News, January 19, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE CAMERA AS A PLAYTHING—THE CAMERA AS A SCIENTIFIC INSTRUMENT.

The Camera as a Plaything.—The general public, as a rule, are not greatly impressed with the exigencies of photographic manipulation. What you have to do is to cover a bit of window glass with some collodion stuff, and put it in a sort of bath, and then, having slipped the thing into the camera, you pour two or three mixtures over it, and there is your photograph; you may blacken your fingers over the job, but that's all. Most people have this idea of photography, and many a fond parent has thought fit to purchase a set of apparatus and chemicals for his boy, so that he may amuse himself with them during his holidays. And the young scamp turns out so clever over the business as to confirm, beyond a doubt, the presumption that photography is but a *bagatelle*. His father is delighted to find he was quite right when he said the boy's fingers would get black over the business, and the lad comes time after time to show the progress he has made with hands apparently that have been shelling walnuts for a month. He holds up a plate upon which the outline of some figure is dimly portrayed, and points joyously to where the eyes and nose of his victim are supposed to be. And so he goes on until mamma one day suddenly becomes aware that he has marked his shirts somewhat too indelibly, for the stains are obstinate against all attempts of soap and water to remove them; while papa finds that an ingenious attempt to manufacture nitrate of silver has been undertaken amid much fuming of acid with some of the family teaspoons. Again, there is the case of the son or nephew abroad, representing some business firm in the Colonies, or holding an appointment in India, who hints in a letter home that he would be grateful for the present of a camera, &c. The relation in England at once burns over with generosity, for will he not receive some charming photographs in return? Just the thing of all others that would make a useful and suitable present. Edwin shall have what he wants at once; and off goes the kindhearted man to purchase what is required. His ideas on the subject are rather cloudy: he thinks that you can purchase the whole affair complete something after the style of an American washing machine; you have some apparatus and things, and a few bottles of chemicals, and a printed list with directions, and the affair is complete. He does not want to bother about buying a lot of things he don't understand; he wants a shopkeeper to tell him how much is wanted for the lot. Will five pounds buy the whole affair, or say ten? In most cases the old gentleman is easily satisfied, and purchases for a round sum a collection of articles, the value of which he knows no more than an octopus. He constantly receives pounds when he ought to have obtained ounces, and in return for his money gets whole jars full of kaolin and other useful but cheap commodities, while his allowance of silver and gold is exceedingly limited. Stay, he is not to be done altogether, for he asks the shopman knowingly if there is a bath among all the requisites he (the dealer) is packing up, for the old gentleman has been told something about this particular piece of apparatus by his correspondent. The latter, to show his perfect familiarity with matters photographic, has wound up his note with the words—"I must have a bath, for it enables one to see on the spot, without returning home, whether the photograph is a success or not." Of course, the purchaser is informed that a bath forms part of the apparatus, and he departs contented, not to say delighted, at his bargain. What Edwin does with the apparatus is not very clear. Possibly he worries himself with the affair for a few weeks, and then, as he has not time or inclination to make himself

acquainted with the art, puts the heterogeneous collection on one side; or, if he determines on taking up photography seriously, he will soon acquire sufficient experience to tell him that a more trustworthy fit-out, and some study and practice, are first of all necessary before he can succeed to his satisfaction. As soon as he begins to regard the camera no longer as a plaything, there is some hope of his becoming a tolerable photographer.

The Camera as a Scientific Instrument.—Germany has determined to build a photo-astronomical observatory at Potsdam, it seems, to form part of the Astrophysicalische Institute there. At present there are but very few of these observatories in Europe; the two principal ones are that at Kew, and that at Montmatre under the direction of M. Janssen. The sun pictures of our Kew Observatory have for some time past been among the most valuable records in existence of our solar body, and have already served many scientific ends. M. Janssen's observatory, now the rival of Kew, has been erected entirely through the energy and perseverance of that well-known astronomer. It consists of a few wooden buildings, which served M. Janssen and his colleagues in Japan two years ago for the shelter of their instruments during the observation of the Transit of Venus. The structures were carried back to France, and M. Janssen, having secured the possession of them from the French Government, proceeded to erect them in an eligible situation north of Paris, on les Buttes Montmatre, a spot that has acquired a sad notoriety as the place of execution of the two French generals, Thomas and Clement, by the Communists. The Photo-astronomical Observatory at Potsdam is, we are told, to be especially fitted up for securing photographic observations of the heavenly bodies, and will thus constitute a third official establishment of the kind in Europe. There are, however, many private observatories in this country, where much good work is done, and we may refer to Mr. Huggins's paper, which appeared in these columns a short time back, to show that the study of the heavenly bodies through the medium of photography is a science that is commanding considerable attention now-a-days. But nothing has yet been done on this side of the Atlantic to rival the fine pictures taken by Mr. Rutherford, of New York. That gentleman's magnificent moon photographs, for instance, stand altogether unrivalled, and his pictures of the stars, the Pleiades, and others, are among the most successful results secured by photo-astronomy. Mr. Rutherford has, indeed, made quite a study of photography applied to astronomical observations, and has investigated the subject of collodions and developers in order to obtain the most perfect and sensitive plates for the purpose. Indeed, photo-astronomy is rapidly becoming a science of itself, for as the sensitive film yields a far more trustworthy result than can be obtained in any other way, astronomers are gradually beginning to make observations whenever possible by such means. M. Janssen, as our readers are aware, wishes to see photo-astronomical observatories established all over the country, and urges those who would further our knowledge of the heavenly bodies to make constant observations of them by means of the camera. Thus, in respect to the changes that are observable over the sun's surface, it as yet unknown whether the phenomena that we roughly designate as "spots" are all of them of the same character—that is, that while some of them may be, for instance, imperfections in the photosphere, others of the phenomena may be due to bodies passing between Mercury and the sun. This is a point, M. Janssen declares, which can only be satisfactorily solved by photo-astronomy, and it affords us, therefore, a good example of the high value of the camera in connection with the study of astronomy. There can scarcely be a doubt, indeed, that photography will, in a little while, be the recognised medium for recording observations made in this science.

ON THE ALKALINE DEVELOPMENT OF THE PHOTOGRAPHIC IMAGE.

BY CAPTAIN ABNEY, R.E., F.R.S.*

It was next proposed to ascertain in which film the developed image was really situated—whether in the exposed or the unexposed film. The double films, which had been treated as described, were taken from the glass plate by applying a damped piece of gelatinized paper to the surface; and after detachment, a similar piece of paper was applied to the surface which had been next the glass. When very nearly dry, the two pieces of paper were pulled apart; one film was found attached to one, and the other to the other. Considerable difficulty was found in this operation, and only about twenty per cent. of the whole was properly manipulated, through our not being always able to hit on the exact amount of desiccation.

In examining these films differences were observable. In some cases the image was found to lie almost entirely in the exposed film, whilst in others a strong image was obtained in the unexposed film. The difference was eventually found to depend on the alkali used in the developer, and on the porosity of the collodion in which the emulsion was formed. When ammonium hydrate was employed and a porous emulsion, the image was on the exposed film; whilst, if potassium hydroxide was employed, a vigorous image was in the top unexposed film. This can be explained through the solubility of silver bromide in ammonium hydrate. The silver bromide would be first dissolved by the ammonium, and then during the course of reduction be carried down to the reduced silver beneath it. Since silver bromide is insoluble in potassium hydroxide, the haloid would be reduced *in situ*.

Having determined this point, it was next endeavoured to ascertain if the photographic image impressed by light on the bottom surface caused a sympathetic action in the unexposed emulsion film. Plates were prepared as before, one-half being coated with emulsion after exposure, and put aside for some days. The films were then separated as described, and to each the developer was applied separately. With one or two exceptions, no image was obtained on the unexposed film. The reason of an image (always imperfect) being obtained in some cases was traced to the adhesion to it of the thin layer of albumen with which the exposed film was coated; for when the albumen was applied after exposure, no image was developed.

The foregoing experiments clearly show that the photographic image has no power of transferring itself, or of creating a sympathetic action in an unexposed film previous to development, and that, therefore, the increase of density and formation of a secondary image must be due to other action than chemical.

If further proof be required, it is only necessary to expose a dry plate, and develop it in the ordinary manner, and after drying to coat it with an emulsion, and develop again. It will be found that where the metallic silver of the first image is beneath it, there the top film develops and gives a counterpart of it. The metal exercises an attraction for the silver on the point of being reduced from the bromide in a similar way that it does when a silver tree is built up, or when a developed image is intensified by the application of pyrogallol acid and silver nitrate. There seems to be a further action, however, which must be taken into account. It has already been shown that silver sub-bromide is more easily reduced to the metallic state than is the bromide. In these last experiments I have found that there is great difficulty in starting the development in the unexposed bromide film if the layer of albumen be too thick, but that, when once started, it proceeds more rapidly. This can be accounted for on the supposition that the attracting particles of silver were too far distant from the emulsion film to exercise their attractive power.

But it seems, from other experiments which are still in

progress, that the atom of reduced silver immediately combines with the nearest molecule of silver bromide, and forms sub-bromide, which is reduced to the metallic state, and its two atoms of silver combine with two other molecules of silver bromide, and so on, the image being gradually built up in this manner. Workers accustomed to alkaline development must have noticed that the feeble image first formed in the film grows in intensity rapidly up to a certain point, and then flags: the reason of this is apparent if we consider the above re-action to take place, and the subsequent exhaustion of available silver bromide which can be acted upon.

One more experiment must be noted. If the film of albumen or gum, &c., between the two films be very thick, a reversed action will take place, which can be explained by the fact that the strength of the developing agent is exhausted in producing the image on the exposed parts of the under film, whilst on the other portions the silver bromide most readily attackable is in the upper film.

I have already indicated that this application of a film of silver bromide after exposure, either before or after development, might prove useful when employing plates which only yield a thin image when developed in the usual manner: other applications will suggest themselves. I have also previously pointed out[†] that intensity may be given to an image by alkaline development if a silver compound soluble in the alkali be gradually added to the developer. This new method, however, seems the preferable one to adopt.

LIGHT, EXPOSURE, AND DEVELOPMENT.

BY H. A. H. DANIEL.†

EXPOSURE

is a branch of photography most important, and without correctness in which all our attempts at good pictures and artistic productions are useless. I will divide this section under two heads: "when to expose," and "how to expose."

"When to expose." In taking pictures we may expose correctly, but unless we expose at the right time we are still not making every endeavour to obtain first-class pictures, and unless high-class work be every photographer's end in view, he must expect to see many pass him in the rush for pre-eminence in the art. In the matter of views, the time for exposure, of course, depends upon existing circumstances.

First and foremost, one of the matters of chief importance is the position with relation to the view in which the photographer places his camera, or, in other words, the selection and composition of the subject. You suddenly come upon a pretty bit of scenery, either near or distant, which strikes you as admirably suitable for the camera. You have only then to look at it from some different points of view, to have at once forcibly demonstrated to you what I mean. There is not one single object to which this does not apply, not even (we'll say) a pig. A full view of two hams and a curly tail would certainly not be the most becoming that could be selected; there is a proper side even to bacon. How often do we see a gentleman's house converted into rectangular elevation with sundry excrescences, instead of a range of buildings with lines pleasing to the eye, pretty grounds in front leading one's eye by easy stages to it, instead of a hard-looking house, the front almost flattening one's nose with its eagerness to at once let you know that the picture was taken for its sake. A photograph on the table, which a gentleman in the City kindly lent me this afternoon, was taken by a professional gentleman in Devonshire. He was asked to photograph the house in the distance, as it appeared from the railway. You will notice that he has given a

* Continued from page 17.

† PHOTOGRAPHIC NEWS, March 27th, 1874.

† Continued from page 24.

remarkably fine view of the rails, the roof of the intended principal object being only just visible. It will be generally conducive to artistic effect to get some agreeable object in the foreground, such as a tree, log of timber, rustic seat, and different other objects at various distances, all of which will impart a far greater degree of perspective to the picture than it would otherwise have. I also consider the position of the sun as regards the subject of great importance. No rule can be laid down, but the photographer must use his own judgment as to the position of the sun that will produce a good picture. It may be almost invariably accepted that the sun should not be in the same position as the photographer, that is to say, with its rays parallel with the lens and camera. In landscapes a side light is as a rule to be chosen, with modifications according to circumstances. In the case of a river, with trees on both sides, the chief care is to expose when the sun is in such a position that any very dark patches in the foliage do not exist, or, at least, not inharmoniously; also, that the shadows from the trees of one bank of the river do not darken the foliage of the other bank to such an extent as to rob it of its pleasingly clear definition. Clear definition must not be confounded with hard effects; most beautifully soft and yet clear definition, with atmospheric effect, may and should be obtained without any tendency to hardness. In the majority of cases it may be taken as positive that foliage is better rendered without the aid of the direct rays of the sun; in cases where water forms part of the picture it is almost always so. But very often very fine and most desirable effects may be produced by dividing the exposure, giving one part while the sun is shining, and another with diffused light. I exhibit a picture marked No. 1, which was exposed in the manner I have stated. We generally find that the lighted or partly lighted side of a landscape is taken, and, of course, in a large number of instances, it is a most suitable proceeding; but there are sometimes most beautiful exceptions to that mode of procedure. A view of the Dee, in North Wales, No. 2 on the table, you will notice is taken with the shaded side of the picture towards the camera, and I think you will admit that the effect is pleasing. But this, like many other features in photography, cannot be learnt as can a process, but requires a true artistic feeling in the photographer, strengthened by experience.

And now I will direct a few remarks under this head to portraiture. The time at which to expose is a point quite as important in portraiture as in landscape photography. Of course, it is well known that in the interest of the plate the exposure should be commenced as soon after it is put in the dark slide as possible, but there are also other matters to be equally well considered. I have always found that it is a good thing to allow the sitters some time to look at specimens and stroll about the studio or place of sitting, as that allows time for their nerves, heart, and muscles to get more composed after their walk or ride. Persons generally indulge on their way in such thoughts as, "How shall I look?" "I wonder if this sitting will do?" "Will my friends like it?" &c., &c. Now, by giving them a number of interesting photos. to examine while you prepare, their imaginations and temperaments get generally a little more calmed, and the chances are much more in favour of a good picture.

Should a friend be with the sitter I see no need of excluding him till you are about to pose, but immediately upon that, without any exception, I would urge that no one be allowed in the studio but the sitter and yourself. Prior to posing it is a good plan to get your camera focussed pretty nearly to the distance required, as every unnecessary motion during posing tends most materially to tire the sitter. Having posed the sitter it is advisable to expose as rapidly as possible, and without delay; and now will be felt the benefit of having no other little fidgets to attend to, keeping you and the sitter just when you least can do away with it. Having next to nothing to do after

posing but to expose, the time that the position and facial expression is required to be maintained is reduced to a minimum. There is one thing I would strongly deprecate, it is the custom of asking your sitter to "please look at that," perhaps a mark, crack, or dirty mark on the wall; or "keep your eyes towards that corner," very likely the visible abode of a miniature tarantula. Should you know that you are photographing a married lady, have a pleasing little coloured print or picture of a pretty child, &c. With a few different little framed subjects or models for placing in different parts of your studio, almost every sitter may have something agreeable to look at, and this is a matter greatly affecting the ultimate expression in the negative. It is not the most easy thing to continue cheerful and happy-looking while regarding fixedly a brass-headed nail, or a single painted eye peering at one, which latter I saw in a professional studio once. From the moment the posing is completed everything coming under the notice of the sitter should be pleasing and free from constraint, if a pleasant expression be desired.

Immediately the lens is uncapped, the operator should at once, by the sound of his feet, let the sitter know he has retired a pace or two, and that his eyes are not upon him, and, above all things, never let the sitter keep his eyes fixed till you are about to uncap the lens.

(To be Continued.)

TWO GOOD FORMULAS.

BY JAMES PARIS.*

If there is one thing more than another that is needed in the dark room, it is a good reliable redeveloper, one that is cheap and of good keeping qualities, and will not stain the negatives. Such a one will be found in the formula below; it redevels and intensifies at the same time, and I have used it for about three years, and have never had it go back on me once. It will cost your readers nothing to try it, and my word for it they will never go back to pyro-gallic, or silver and iron—

Protosulphate of iron	...	...	1 ounce
Citric acid	...	...	1 "
Water (rain)	...	...	1 quart

It will turn a beautiful lemon colour. For use, after washing, take as much as will flow the plate in use, and add a few drops of a 30-grain solution of silver. Be careful not to add too much, as it will make the negative harsh. I have noticed that if (after the addition of the silver) kept in the dark, it can be used again by adding more silver; but if white light strikes it, it is spoiled. I have been trying it in place of pyro-citric acid and silver to intensify albumen transparencies; have not tried it enough to form any opinion yet, but it gives a very rich brown tint. Will report again.

A Good Collodion.—Now I think I hear some one say, Here is another formula for collodion! Well, there is, and if over a year's trial of it is any recommend, I can give it that; and I must say I have never used anything better for white drapery or velvet (black), or both together, and for fineness of detail. It works quick, and will keep as long as you want; the older it gets the better. I have seen some that was six months old, and almost as white as plain collodion. It is good for both indoor and outdoor work:—

Alcohol and ether (pure con. sulph., eq. parts)	1	ounce
Iodide of cadmium	...	5 grains
Bromide of potassium	...	2 1/2 "
Chloride of calcium	...	1 grain

Bath 40 grains, slightly acid. Developer, from 15 to 20 grains strong. In mixing the collodion I usually dissolve the iodide and chloride in the alcohol, and the potassium in a little water, and add to the above; then

* *Practical Photographer.*

ie cotton, and shake well; then add the ether a
at a time, shaking well between each addition. Let
and settle. Before using, take out what you want to
nd add a few drops of tincture of iodine.
haps the above will not work exactly right under
light, any more than any other formula, so you must
the proportions of the iodine and bromine and cotton,
not the chloride, and use judgment in mixing it. Try
nd see if it is not all I claim for it.

PHOTOGRAPHIC IMAGES OBTAINED BY MEANS OF ASTRONOMICAL LENSES.

BY M. A. ANGOT.*

It has been remarked for some time past that the photo-
graphic image of an illuminated object is dilated by reason
of the luminous parts trespassing upon the black ground.
Hence M. André's recent researches upon diffraction, that
gentleman having discovered phenomena of the same order
in observing heavenly bodies through the telescope; he
charged me with the investigation of the matter so far as
photography was concerned, and I have now the honour to
submit the first part of my work to the Academy.

The nature of my experiments consisted in taking, under
various circumstances, a photographic image of a luminous
source, formed by two rectangles, separated by an interval
of darkness. The augmentation of dimension that is
observed for each luminous rectangle is equal to the diminu-
tion of the dark space between them. The sum of the two
quantities should, therefore, be constant, a mode of verifica-
tion which gives the degree of approximation in each
experiment.

The images were taken by means of a photographic
lens which the Transit of Venus Committee were good
enough to place at my disposal. The lens had an aperture
of 13 centimetres, and was rendered achromatic by the
separation of the two glasses of which it was composed; it
had a focal length, in my experiments, of about 3·80 metres;
1-500th of a millimetre measured upon the image corresponded,
therefore, with 0·109. The lens and the luminous source to
be photographed were placed in one of the cellars of the
École Normale, at a distance of 87 metres from one another,
a distance which rendered necessary the great focal length
of my lens. Finally, the photographic images were measured
with a micrometer scale, also the property of the Transit of
Venus Committee. By neglecting some of the precautions
employed in measuring the images of the Transit, I am
enabled to shorten materially the time necessary for the
measurements, and I confined myself to estimating to the
1-500th of a millimetre, which was quite exact enough for
my purpose.

The main point is, that the dimension of the photo-
graphic image increases materially as soon as you augment
the duration of pose or the intensity of the light. This
increase is such that in the circumstances under which I
operated it surpasses 0·2 millimetres in ten seconds. As
examples, I submit herewith the measurements of seven
images obtained successively upon one Daguerreotype plate,
and in the production of which no change has been effected
beyond lengthening the duration of the exposures.

Duration of exposure.	Dimensions in 1-500th of millimetres			Total. l+d
	of the luminous rectangle.	of the dark interval.		
10 seconds ...	593·5	192·6	...	786·1
30 " ...	618·5	168·6	...	787·1
40 " ...	624·0	163·6	...	787·1
1 minute ...	632·6	155·2	...	787·8
2 " ...	645·7	141·4	...	787·1
4 " ...	656·4	130·0	...	786·4
7 " ...	673·8	113·4	...	787·2

The unit in these calculations is, as I have said, the 1-500th

of a millimetre, which corresponds to 0·109, and the
column l+d, in which the numbers should be constant,
show that the mean error is about 0·001 millimetre,
or 0·005.

The phenomenon is exactly the same if you operate on
dry or wet collodion, or if you vary the intensity of the
light and allow the exposure to remain constant.

The first explanation that strikes one is to suppose
an approachment of the photographic action from one
point to another, an approachment which should increase—
like the numbers above mentioned—with the intensity of
the light and the duration of pose. If such an hypothesis
were correct, the dimension of the image would be smaller
upon an ordinary plate than upon another which has been
exposed for a brief while to the light before receiving the
photographic impression. In the last case, in fact, the
action, having commenced, should continue more easily.

To assure myself of this, I exposed to light, first of all,
one half of each plate, and then made with the two halves
a series of experiments in pairs, giving the same duration
of exposure and intensity, so that all the circumstances
under which they were taken might be identical, with the
exception in the one series of the preliminary exposure
to light. The experiment was repeated a great many times,
and always gave results contrary to those supporting the
theory of an approachment of the photographic action. I
need only quote the following numbers:—

1. Iodised and Bromised Daguerreotype Plate.

Duration of exposure.	Dimensions of the image	
	in the part exposed first of all to light.	in the part not exposed.
30 seconds ...	514·9	535·6
1 minute ...	537·3	560·4
4 minutes ...	563·0	681·5

2. Upon a Dry Collodion Plate.

Duration of exposure.	Dimensions of the image	
	in the part exposed first of all to light.	in the part not exposed.
Intensity { 1 minute ...	584·5	622·7
1. { 2 minutes ...	620·5	641·6
Intensity { 1 minute ...	516·5	558·0
about ½ { 2 minutes ...	558·5	579·0

I have not yet finished the determination of some measure-
ments of images taken upon wet collodion; but they
certainly confirm the above results.

The images, therefore, taken upon plates that have
received a preliminary exposure to light are always *smaller*
than upon those which have not seen the daylight—a good
proof against the hypothesis that there is any approach-
ment of the photographic action. The phenomenon is to
be explained on purely physical grounds; and this is what
I shall attempt at an early opportunity when I have been
able to study the laws according to which the dimensions of
the images vary with the duration of exposure, the intensi-
ty of the light, and the diameter of the lenses. I shall sho-
how all these laws—as also the effect of preliminary
exposure—may be deduced from the ordinary theory
diffraction in the focus of a lens.

NOTE ON GLASWOLLE.

BY M. LIMOUSIN.*

GLASWOLLE is calculated to render valuable services
pharmaceutist and chemist. It might be termed
wool very well, or glass silk, and it is a product en-
in Germany, and more particularly in Austria, for
purposes in the laboratory.

The *glaswolle* which I purchased during a recent
the Rhenish provinces was very finely spun gl
may well be likened to fine silk in its appearanc
is fused, and then spun on hot metal cylinders
at a considerable rate; it is only Bohemian glass

* *Bulletin de la Société Française.*

* Read before the French Photographic Socy

that can be employed for the purpose, and hence the trade is in a very few hands. Examined under a microscope, the threads of this substance are as tenuous as cotton or silk threads. They are resistant, but break more easily under a strain; they are remarkable for their extreme suppleness. At first sight it is impossible to believe in the mineral origin of the material, so much does it resemble silk or cotton fibre.

In the Austrian laboratories it is employed for filtration by putting a small quantity of it, in the form of a plug, into a special kind of funnel, which has a cavity to receive the substance. But such an arrangement in the funnel I myself have found to be wholly unnecessary, for the superior density of the glass over cotton-wool permits it to remain at the exit tube of the funnel.

By reason of its inalterability, which is the same as that of the best crystal glass, the substance presents great advantages for the filtration of acid and alkaline solutions, even of a concentrated nature, as well as of other substances, such as nitrate of silver, albumen, collodion, &c. Photographers, therefore, I believe, will be able to make good use of such a method of filtration.

Owing to the smoothness of the fibres and the absence of all capillary action, the liquids are not prevented from penetrating, by a close matting of the *glaswolle*, in the filter. Moreover, it does not possess the disadvantage shared in by all paper and fabric filters, of absorbing the liquids under filtration; neither does it absorb aromatic compounds dissolved in distilled water or alcohol. It is much preferable to amianthus, which, by reason of its parallel fibres, will not permit of its being inserted into flexible bulbs, and which has, moreover, the defect of allowing particles to float away with the liquid.

In chemical analysis *glaswolle* is particularly useful for several reasons; among others, that filtrate attached to them can be estimated with more ease and accuracy than is the case when collected upon filter papers which have to be burned.

As a final application of this *glaswolle*, I may mention its adaptability in the fashioning of glass pinchers for employment with the chromate and nitrate of silver bath, and also with iodine tinctures, &c.

The *glaswolle* is rather expensive, and may be estimated at about forty centimes per gramme; its excessive lightness, however, allows one to construct a large number of filters from this quantity; indeed, a gramme would last a chemist or photographer a very long time indeed, if he took care of the substance and cleaned it well after every operation, washing it thoroughly in plenty of water, and drying it spontaneously in the air.

[This fine glass wool is employed in many chemical laboratories in this country.—Ed. P. N.]

CARBON TRANSPARENCIES ON GLASS.

THE method used by the Autotype Company in preparing transparencies by single transfer is described by Mr. J. R. Sawyer in a letter to Dr. Vogel, who embodies it in his recent correspondence with our Philadelphia contemporary. Mr. Sawyer says:—

"At first we have to prepare the following solution:—30 grains of gelatine, soaked some time in 500 cubic centimetres of water (cold), and then dissolved under slight warming. To this solution (continually stirring it) is to be added as much of a solution, composed of 2 grains chrom-alum in 30 cubic centimetres of water, as is necessary to keep the gelatine mixture thick and dough-like. Then we have also to add, with continual stirring, as much lead vinegar, by drops, until the mixture becomes liquid again; it must be kept moderately warm. With this

gelatine liquid, using a camel's hair brush, we then proceed to brush a carefully cleaned glass plate, on which the pigment picture shall be put, all around the margin about one centimetre broad, and let it dry. After that the plate is to be slightly warmed, laid horizontal, and the gelatine solution poured entirely over it, in which case a brush may also be used, when necessary, to divide it regularly. This must be dried again, which will have to be done with the utmost possible care to keep the dust off; also during the further preserving of it. In this manner we may prepare a large number of plates, and keep them ready, for their durability is of an unlimited extent.

"After the sensitized paper is taken out of the copying frame, the margins of the same are to be bent up a little, so that it forms a kind of bowl or saucer, in which is to be poured thin, normal collodion, in the same manner as in pouring over a plate. This paper, which was previously toned, and then collodionized, is to be hung up in a dark place for drying. As soon as this takes place, it is necessary to soften, in the usual manner, this copy in water, and bring it together under water, layer on layer, in the closest contact possible, with a gelatinized glass plate, which has also been in water some time, carefully avoiding air-bubbles, dust, &c.

"After that we have to take the plate out of the water, and give both the layers a still better connection by means of the squeegee, and then let it all rest from about five to ten minutes; after that time we may develop in the manner already known by means of warm water, and the result, after a careful observation of these directions, will be an excellent one."

NEW METHOD OF PRECIPITATING GOLD FROM OLD TONING BATHS.

BY FRITZ HAUGK.*

AFTER the toning bath has done its duty, I filter it into a white flask, render it alkaline with some bicarbonate of soda†, and add, by degrees, so much of a concentrated alcoholic "aniline-red solution" as will render the liquid the colour of raspberry syrup. After this I put the bottle for six or eight hours in a well-lighted window. At the end of this period, the gold still remaining in solution will have become precipitated in the form of a dark violet powder (sub-oxide of gold), and the superfluous liquid has become colourless. The latter I pour away as useless, and so carefully recover the precipitate. After every toning operation, I filter the liquid which has been used, and put it into the same bottle immediately upon the precipitate formerly obtained, and then proceed as before.

In this way I secure, after a time, a sufficient quantity of sub-oxide of gold, and I then collect it on a filter, and wash well. I then dry the filter and filtrate, and burn them. The ash and residue is then dissolved under the influence of a slightly warm temperature in an excess of aqua-regia; the solution is afterwards diluted with some distilled water, and the undissolved residue filtered off. The gold solution secured in this way I then evaporate, and the residue is very nearly chemically pure chloride of gold. The slight impurity with which it may be contaminated by the ash of the filter is scarcely worth mentioning.

On the walls of the flask in which the gold toning solutions are collected there is found in time a gold mirror. When this has become pretty thick, it should be removed, which may be done by rinsing the bottle with a little aqua-regia, the latter being rinsed against the walls of the bottle, which is put into warm water for a little while. In this way the deposit of gold is quickly dissolved.

* *Photographisches Archiv.*

† I invariably employ the neutral chalk bath recommended by Wharton Simpson.

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TONING WITH CHLORIDE OF PALLADIUM.

THE question of employing chloride of palladium in lieu of chloride of gold for toning has been again raised by our Paris contemporary, the *Moniteur de la Photographie*. M. Ellerbeck, in a communication to that journal, gives his experience of employing this costly salt for intensifying transparencies after fixing. The tint it imparts is a rich black one; but beyond this the palladium salt possesses the advantage, according to M. Ellerbeck, of not acting upon the half-tones if permitted to remain in contact with the photograph for a considerable period. The palladium acts in the capacity of a redeveloper, M. Ellerbeck says, strengthening the image and invigorating as well as darkening its tone.

In treating transparencies with chloride of palladium solution, they are rendered more suitable for the lantern and such like purposes. The collodion image, after fixing, must be thoroughly washed to remove every trace of the solutions that have been employed in developing and fixing; as otherwise the palladium will be precipitated in a metallic state, or in the form of sulphide. The strength of the solution recommended is one part of chloride dissolved in twenty parts of distilled water.

Palladium, as our readers are aware, occupies a position in regard to cost midway between platinum and gold; but there is so little demand for its salts that, in this country at any rate, they are much more expensive than those of gold. About fifteen years ago we received some fine examples by our American Correspondent at the time, Mr. F. F. Thompson. In carrying out his instructions we found the chief difficulty was a tendency to produce a cold black; and the salt was, moreover, very costly. M. Ellerbeck states that the chloride of palladium can be purchased in Paris for one franc fifty cents a gramme; and under these circumstances its employment, probably, would hardly be more extravagant than that of chloride of gold. In this country, however, the palladium salt is much more expensive, and may set down at £6 per ounce, or, in other words, at double the price of chloride of gold. Whether the results obtained by palladium toning are so advantageous as to warrant this increased cost we are not in a position to say; but until the salt is obtained at a more reasonable rate in Great Britain, its practical character will stand in the way of its general adoption.

M. LAMBERT AND CARBON IN THE UNITED STATES.

THE introduction of carbon printing amongst American photographers, under the auspices of M. Lambert, appeared to be a great success, if we may judge by the fact that the majority of the leading photographers have become licensees, and many of them write enthusiastic expressions of their satisfaction with the results they obtain. Mr. Rulofson, President of the United States National Photographic Association, having obtained a licence when in New York, tried the process himself on return to his home in San Francisco, and at once telegraphed to secure the entire licences for the State of California. We find the names of men like Kurtz, Napoleon Sarony, Gutekunst, Notman, Bendann, and many more of the distinguished and leading portraitists, not only amongst the licensees, but emphatic in their praise. A series of six silver medals and six bronze medals, for the best examples of different processes included by M. Lambert in his licenses, has been offered to the licensees, the exhibition to be held this month. American photographers are paying one hundred and fifty dollars in gold (about £30) for the use of the five patents taken out by Swan, Johnson, the Autotype Company, and M. Lambert, which cover the operations in carbon printing as at present worked.

A noteworthy fact we find mentioned, regarding which English photographers would like further information. From the statements of M. Lambert and his licensees, it appears that in the United States they have been able to work without difficulty during the hottest summer. When Mr. Rulofson took his lesson the thermometer stood at 102° Fah. And this, M. Lambert says, was effected without the aid of ice, cool cellars, or special ventilation. At the present season this question is not one of moment to carbon printers in this country; but when summer returns we shall ask M. Lambert, on behalf of many English carbon printers, to tell us how he avoids the difficulty generally experienced, and prevents the undue softening and running of the gelatine on the tissue.

As an example of the correspondence on the subject, we extract the following letter from the *St. Louis Practical Photographer*. Mr. J. W. Wykes, writing, says:—

"In August last I was in New York, and my attention was called to the pictures then on exhibition at Messrs. Anthony and Co.'s, and produced by the said processes, and I must say that the work was so far superior to anything I had anticipated, that I could not resist the desire I felt to know more about the means employed in producing such effects. I had no money to throw away, but had a little to invest, if I could see a fair prospect of a return and I have always found that it pays to be in advance in photography, and this looked to me like a step in the direction. I was told that it could not be worked in hot weather, and other objections; but as it was then the hottest time in a very hot city, I thought it a good chance to test the process. So I went in, and although the work was so intense that I could scarcely endure it—being—the picture came out as fine as though it was the favourable time. After returning home, I at once put it in competition with silver in my gallery, and to-day it is absorbing all my best work, and would do so if I did not make such a distinction in the prices as to the two processes.

"The question is asked in certain quarters, W. the man who has invested in these processes has discarded the silver for carbon? I take pleasure in saying that I am one of the men that has done so; as I consider my interest to do so, and for the season; but by making silver prints for cheap work the two classes of trade, and give my customers work at an advanced price, and it is appreciated by the public. I am glad to know that a goodly number of the best workers in our cities have taken an interest in the truly great improvement, which is to remove the stigma from the photographic art—the fading—and place it upon a permanent basis for the future."

SHOWING PROOFS OF PORTRAITS.

THE system of showing proofs from three or four negatives is, doubtless, one of great advantage to the sitter, inasmuch as one of several portraits may be infinitely more satisfactory in expression, position, and individuality, generally, than the others, each of which may be equally good as a photograph. But the system is fraught with much trouble to the photographer, and, in some cases, degenerates into a serious tax. In some cases, several negatives are retouched, in order to send out proofs from each, and these proofs are not unfrequently, in spite of rules to the contrary, retained by the sitter. The system of sending out proofs at all is of doubtful advantage to the photographer, and should, at any rate, be governed by precise conditions. Such negatives as meet the photographer's own approval should alone be sent out; the word "specimen" should be prominently written, perforated, or stamped on each, and the return of all, selected or unselected, should be made imperative. A correspondent of the new American journal, writing on this subject, says:—

"The photographic art has been very much hampered by customs which have almost become laws. One of the greatest is the showing of proofs. It is only reasonable to suppose that an artist who has devoted a lifetime to his profession, and having acquired a thorough knowledge of it, is a judge of a picture if good or bad. Then why should he submit his work unfinished to the public, whose judgment upon pictures is questionable? for the showing of proofs only amounts to this: 'Is my work good or bad? If you decide bad, I will do it over again.'"

"Now, in all other professions or trades, if we give an order for a piece of work, it is not submitted to us until finished; and if we were to criticise during its progress, we would be gently told it is unfinished."

"In my opinion, the showing of proofs is humiliating to a man who understands his business. In most cases pictures would be satisfactory when finished, but as proofs are condemned, which occasions so many instances of work being done a second, and even a third time. If the public were made to understand that whatever they ordered would be final, it would abolish the continual experimenting at the expense of the photographer, which makes our business as discouraging."

The Editor, Mr. Fitzgibbon, adds:—

"The above remarks on the showing of proofs is from one of the best photographers in this country, and we think he has struck the right chord. Abuses will naturally get into the profession, as well as improvements. The proof system, when first introduced, was in a measure intended to gratify the tastes of the parties in regard to expression; but now there is no end to the requirements wanted and fault found with the elastic photographer who tries to suit the tastes of many that have no taste at all, and who do not know really what they want; and for the want of some good reason, fault is found with good work—the style of dress, posing of the sitter, arrangement of hair—and, not to offend his patrons, he indulges them, until he finds there is no end to the troubles and labours he has brought on himself in trying to accommodate them. Do away with proof-showing altogether, and you will sleep sounder at night."

COLLATERAL ADVANTAGES IN PRELIMINARY COATINGS OF ALBUMEN.

In the very early days of the collodion process, the use of a preliminary coating of albumen on the glass plate was proposed and tried—successfully and continuously in everyday practice by some; unsuccessfully, and therefore only briefly, by others. Many photographers who tried it, and were charmed with the improved character of the negatives it aided in producing, gave it up with regret and reluctance, because, in a short time, the silver bath got out of order, and the plates began to fog.

Why some photographers succeeded and some failed in using the same materials, was not clearly made out at the time, but an examination of the question in the light of after-experience suggests that success was probably due to the use of dilute albumen, as failure was doubtless due to want of dilution. Pure white of egg, in some cases, and in others diluted with three or four times its bulk of water, constituted the preliminary coating then employed. The revival of the practice a few years ago was effected under different conditions. Very dilute solutions of albumen were recommended, and one ounce of albumen in forty ounces of water is now a common preparation for preliminary coatings. Whilst this is sufficient to secure the multitude of advantages which are found to attend this preparation of the plate, it gives, at the same time, immunity from risk of spoiling the silver solution, or causing any tendency to fog. We are not going to discuss its advantages or disadvantages in relation to the cleaning of plates here. That is satisfactorily done by Mr. Hughes in our YEAR-BOOK just issued. To many who found it difficult or almost impossible to secure subordinates who could or would really clean a plate, the boon offered by albumen as a preliminary coating was invaluable. To those more fortunate, who never had any trouble with dirty plates, the question has naturally possessed but little interest. But there is another phase of the question, regarding the use of such preliminary coatings, which possesses interest for every one. An interesting communication, from a gentleman who had many years' experience as a printer for the profession, points out the great advantages in stability in negatives which have been so treated. Indeed, he regards a negative which has not received such preliminary coating as absolutely unsafe. Mr. F. E. Elliot, with whose name as an able and experienced photographer most of our readers are acquainted, writes as follows:—

"The preliminary albumenizing of glass plates is one of the most valuable inventions of the day, as I do not consider any negative safe for any length of time that has not had such a treatment; it has saved me pounds in the preservation of negatives from the ill effects of damp and heat, when left in the printing-house, and where I used to lose numbers from the bulging reticulation, I now never lose one; in fact, I have had frames accidentally left out in the rain, and the negative swamped, and when formerly it would be all over with the plate, now after a wash with perhaps a slight touch of weak cyanide, the negative is as right as ever. Again, I have just compared several plates that I have taken some thousand copies off: those that I had not albumenized, and which are no worse than plates I have printed when with my late partner, Sedgfield, of negatives by Bedford, England, and others for book illustration, are worn out and full of spotty holes; the albumenized plates are as perfect as ever. I should say for carbon printing, which is more horny than all paper, it is almost a *sine qua non*."

The hints here given are well worth pondering.

QUALIFICATIONS FOR AN OPERATOR IN AMERICA.

A CORRESPONDENT who spent some time as an operator in the United States sends us the following amusing letter, which he received in answer to an application for an engagement in a portrait establishment. The writer says:—

"DEAR SIR,—Since writing to you, I have come to the conclusion that I now have a boy with me actually too young to leave his mammy yet; and in absence of any lines from my friend Capt. R—, I will take the liberty to propound to you the following questions, trusting that you will not get your back up:—

"1st. Have you ample experience in making the Bon Ton with the multiplying instrument?"

"Are you sure *pop* with *Babies*, and do you really understand Photography?"

"Are you willing to make pictures *Early* and *Late* as pictures can be made?"

"Can and will you *Get up and get in a reel*? and, further, can you keep cool in *hot* weather, and let your *hair* grow?"

"Please answer as many of the questions as you think proper at the earliest moment. Also please ask Capt. B—— whatever you may wish to know about me, and ask him if he will please say his say about you, and oblige yours in haste, J. O."

"P.S.—One more, and I have expired. Will you get your Stamps every Saturday Evening, and make yourself generally useful as well as ornamental for so doing?—Truly yours, J. O."]

EDINBURGH PHOTOGRAPHIC EXHIBITION.

(SECOND NOTICE.)

We are glad to learn that, great as has been the expense of bringing together and exhibiting such an extensive collection of photographs, there is every probability of the Exhibition being a commercial success. The public interest is daily on the increase, and it is a pity that the requirements of the Royal Scottish Academy compel it to be closed to-morrow. The medal awards having been published, considerable interest is being given to the successful pictures, and although it is not in the nature of things that the decision of the judges should meet with universal approval, it is satisfactory to know that the dissentients are very few.

In landscape photographs the Exhibition is very rich. If there are any who still have a doubt as to the suitability of dry plates for the very highest class of work in this direction, they have only to look at the exhibits of Mr. Wm. England to have the doubt dispelled. Hung together are six charming views in Switzerland, Italy, and Savoy, so soft, yet full of brilliant detail, and most perfect gradation, even when, as is generally the case, such difficult combinations as summer foliage and snow-clad mountains are included. Where all are so excellent, it is difficult to particularize; but we may mention "Monk and Eiger from St. Beatenburg" (No. 767) as a work of rare merit. The foreground is the bank of a lake, with finely-grouped trees on the right and left, and a few well-arranged figures in the centre. The middle distance includes groups of grand mountains, whose shadows are more or less indefinitely mirrored on the bosom of the lake, and, rising high behind all, are the beautiful snowy peaks so well known to travellers in the district. Almost equally fine, and on a much larger scale, are the pictures of Mr. Henderson, of Manchester. They are from collodio-albumen negatives, and rival the best wet collodion work in all good qualities. "A Trout Stream" (No. 287) is a somewhat difficult subject admirably rendered. On the right is a richly-wooded hill, nicely balanced by a tower of a half-hidden church, and in the foreground a rippling stream broken up into many pools, which would be the delight of a disciple of the Waltonian school, while a little higher up there is a pretty fall or weir, the water of which is beautifully transparent. Much less ambitious, but technically perfect, are several landscapes by Mr. H. A. H. Daniel, of Bristol. No one will grudge him the well merited medal. He seems to revel in quiet nooks and corners, and if such subjects present fewer difficulties in their execution, he amply makes up for it by the perfection which he has attained. "The Cascade" (No. 722) is an exquisite bit of work. Thoroughly pre-Raphaelite in treatment, every leaf and branch is so sharp and well-defined, that they might be used as illustrations of botanical lectures. In the centre of the picture is a cascade, a fine water-fall, on a rock, and breaking up into beautifully

Mr. Alexander Henderson, of Montreal, contributes eight thoroughly characteristic pictures of ice scenes on the St. Lawrence, Montmorenci, and Niagara. In "Ice just Going" (No. 594) we have an example of the ticklish work a photographer will undertake to catch what his fancy may induce him to covet. The view is from St. Helen's Island in the St. Lawrence, and includes the city of Montreal, and its mountain in the distance. The adventurous photographer has planted his camera on one of the huge blocks of ice which accumulate during the winter months, and there is unmistakable evidence that the break-up is already begun. But, with the hardihood born of familiarity with such scenes, several figures are posed on some of the masses, comparison with which conveys a tolerably correct idea of the size of them.

Cloud effects, always difficult to get, and often much misused when got, are well represented. Prof. Piazzi Smyth, Col. Wortley, and Mr. Benjamin Wyles, of Southport, all show good work; "Cloudland" (No. 657), by the latter, is a frame of four prints, the negatives of which would be invaluable to any printer of landscapes. Mr. John H. Morgan, of Clifton, also shows some really good work; quiet in tone, and somewhat wanting in contrast, it is, nevertheless, characterised by very careful treatment and excellent composition. "The Mountain Pass" (No. 1060) is a good example. The immediate foreground consists of the furrowed banks of the stream, or, rather, the bed of one, and so indicating the dry summer season. A quaint old bridge is in the centre, and, right and left, as quaint a cottage, and a spur of a mountain in pretty deep shadow. The middle distance consists of a well-defined mountain, or hill, and the extreme distance is a mountain on which there is a fine play of light and shade, and peculiarly fine atmospheric effect.

The Edinburgh amateurs come well to the front. Mr. Pantou and Mr. Muir have both got medals for really excellent work, and Messrs. Crichton, Mathieson, Pillans, and several others, are not certainly far behind. The latter, in a frame of sixteen small prints (No. 867), includes one of Lake Monteith and one of Tontallan Castle, that, both for composition and general treatment of light, are very commendable. Mr. Crichton has a frame of nine clean, crisp prints (No. 587), of which "Loch Lubnaig" is the best, and, for general effect of atmospheric distance, is all that can be desired. Mr. Edwin Smithells, of Barrhead, sends a number of well chosen views, the best of which is his "Head of Loch Katrine" (No. 575); and Mr. Mathieson is equally fortunate in his bits of "Old Edinburgh." In his frame No. 642, the "White Horse Close," one of the most picturesque remains of a bye-gone time, is most picturesquely rendered.

Our space, however, is now exhausted, and a notice of the portraits must stand over till next week.

FRENCH CORRESPONDENCE.

SIMPLE PLAN OF TESTING STRENGTH OF SILVER BATHS—
M. POITEVIN ONCE MORE—SELF-PRINTING OF FUNGI—
APPLICATION OF METHOD TO PHOTOGRAPHIC PRINTING—
M. SCOTTELLARI'S SYSTEM OF ILLUMINATING STUDIOS WITH VIOLET LIGHT.

We have just received from M. E. Boivin a note touching the analysis of silver baths which will, no doubt, be interesting to the readers of the PHOTOGRAPHIC NEWS. Of all the methods employed to discover the nature of silver baths made use of in photography, our correspondent asserts that the most convenient and economical is the one he describes. Into a flask or glass vessel graduated in centimetres, from 0 to 25, for instance, is poured to 0 the necessary quantity of the undermentioned liquid, namely:—

Distilled water	...	1,000 cub. cents.
Chloride of sodium (dry)...		6-60 grammes
Bichromate of potash	...	1 gramme

Into a test-tube is put two cubic centimetres of the bath to be analysed, and it is then sufficient to pour in drop by drop the above saline mixture. There is formed in the first place a purple precipitate, which soon becomes white by oxidation of the liquid. The experimenter then turns to the graduated vessel, to see how much of the liquid has been expended to bring about such a result. The figure revealed gives exactly the weight of nitrate of silver contained in 100 cubic centimetres of the bath submitted to analysis. According to M. Boivin this plan of analysing the silver bath is much preferable to that of employing an argentometer, which never gives one the proper weight of nitrate of silver in the bath, because the latter becomes charged after a time with a considerable amount of chloride and iodide salts resulting from daily work, which may erroneously be calculated as silver salts.

And now there is grand news to be told. M. Poitevin has appeared once more upon the photographic horizon. The learned and fortunate experimentalist, to whom photographers owe so much, has for the past ten years completely renounced photographic investigation, and cast on one side those labours which have earned for him so honourable a name. Living retired in a little town of the department of Sarthe, where he had been nominated Mayor, he passed his life as a tranquil landowner, far from the struggles and disputes of the scientific world. Now, however, an unexpected circumstance brings him back to the world which he believed to have abandoned for ever.

M. Poitevin had often remarked that certain fungi or mushrooms (*agarics*) after they had arrived at a certain stage of maturity, when placed upon a plane surface of marble or glass, left behind them, after a few hours, a very clear image of their leaves, &c., in half tones. This image was formed by the coloured dust between the leaves which falls upon the surface on which the fungi had been lying. M. Poitevin tried to reproduce the same effect, but under more favourable conditions. He experimented with sheets of glass, or paper stretched very evenly over glass, and having placed the fungus upon this surface, covered it up with a glass shade to prevent the surrounding air having an effect upon the fall of the dust. After an interval of five or six hours, he obtained a very clear impression of the leaflets. The image was not in any way stable, for the dust did not adhere to the paper, and was disturbed on the slightest friction. At the same time, he succeeded in fixing the image by employing a varnish made by dissolving a gum resin in alcohol or essence, a method which he afterwards abandoned for a better plan of operating. At present he makes use of a sheet of paper prepared with gelatine on one side only; he puts this sheet upon a plate of glass, gelatine face uppermost, and having moistened it with a brush, spreads the sheet flat with the same means. The film of gelatine is in this way moistened, and the superfluous moisture having been removed, the mushroom or fungus is put upon it, the leaves downwards. If the fungus is light and small there is no necessity for suspending it, but otherwise it must be removed at some distance from the sheet, as the leaves will get folded and the image will not then be distinct. M. Poitevin suspends his fungi by means of little supports made of thin metal and thread, from the centre of which the mushroom hangs. The whole is covered up by a glass shade, and the formation of the image allowed to proceed for five or six hours according to the season and the quantity of pollen contained in the fungus. At the end of this time the shade is removed and the fungus carefully lifted off the paper, and the result is upon the gelatinized paper, a most perfect image which is fixed as soon as ever the paper is quite dry. The same fungus will furnish successively three or four impressions. Some of the fungi are brown, violet, yellow, &c., and they yield prints of these colours. In the case of the lighter colours, such as yellow and white, they are reproduced upon gelatine tinted of a sombre colour.

M. Poitevin has illustrated this communication of his by a print of the edible mushroom, which has at first rose-coloured leaves that afterwards become brown after some days. The colour seems to be quite permanent so long as the impression is kept from the damp. M. Poitevin thinks that the process might be turned into a method of photographic printing, and in this wise:—Upon a metallic fabric or very fine silken stuff is produced a cliché, in which the parts corresponding to the whites will be impermeable to the dust or colouring matter, while the black and half-tones allow the powder to pass in direct proportion to the intensity of the tones of the design to be reproduced. M. Poitevin has promised to make some experiments in this direction, and to communicate to us the result.

M. Scotellari, who has seen the article published in the PHOTOGRAPHIC NEWS, upon illuminating with violet light, of the 5th of January, has written to ask me to say that the experiments therein detailed are incomplete. M. Scotellari urges the readers of the NEWS to make further experiments, and he mentions one which is within the power of all. Let a ray of sunlight penetrate through an opening in the shutter into a dark room; then interpose in its passage a prism, and there will be thrown upon a screen, placed at a suitable distance, an image coloured after the manner of the rainbow. By substituting for the screen a sheet of sensitized paper, or any other surface sensitive to light, the experimenter will be convinced at once of the superiority of violet light in regard to its chemical action. We may add that the experiments to which M. Scotellari invites all photographers desirous of practically appreciating his system continue from day to day, and that the results obtained are always in favour of his mode of lighting. We shall have occasion to come back to this subject.

ERNEST LACAN.

A BELIEVER IN SPIRIT PHOTOGRAPHY.

BY J. J. T. G.

THE old man came to have his photograph taken—beyond mistake an old man from the country. "What will you charge me for taking out my picture, sir?" "Half-a-crown."—"Nothing less?" No; that is the lowest price for a single carte."—"Well, you see, sir, 'tis for a little girl of mine that's in America, and she's been writing to me for it these three years, so I had to come at last."

Assistant shows some specimens. "Which style would you like?" Old man from the country takes one up, looks closely at it for some time, then, "Yes, that is nearly like; but I haven't a white waistcoat."—Proprietor: "Oh! that's not yours, you know; yours will be like you, and the clothes the same as those you wear." Explanation is apparently satisfactory, as old man from the country takes out his money and pays. "Will I get it now, sir?" "No; say in three or four days."—"Thank you, sir," going away quite contented, till the assistant runs to call him back: "Why, you haven't sat at all yet; please step upstairs to the gallery. This way, sir."

In due time the negative is taken, and old man descends, and is about to depart, when an idea suddenly occurs to him. "My old woman wears a brown dress, and a white cap, and a plaid shawl across her shoulder. She is about my own age. Couldn't you put her in this picture alongside me?" After a good deal of persuasion, we succeed in convincing the old man from the country that as we do not possess a "spirit licence" in photography, we cannot possibly photograph the invisible, and that if he wants the "old woman" taken, she, too, must visit the studio.

So he went away, but I fancied that there still lingered in his mind a feeling that if we liked to oblige him, we might have put the "old woman" in as well.

MICRO-PHOTOGRAPHIC RESEARCH ON COLLODION.

BY M. JULES GIRARD.*

In examining, under a very powerful microscope, a negative developed either by means of sulphate of iron or pyrogallie acid, it will be remarked, nearly always, that in the clear and non-impressioned parts there are crystals uniformly spread over the whole surface, having a measurement of scarcely 100 of a millimetre. These crystals of iodide of silver, which are sometimes exceedingly abundant, constitute what is termed fogging in a plate, and are the cause of many failures. They are often spread over the whole of the sensitive surface, like a cloud that light cannot penetrate. I have the honour to forward to the Academy of Science a micro-photograph of these crystals, enlarged to 300 diameters; it has been secured from a clear portion of a landscape negative, where the so-called fogging was imperceptible to the naked eye.

The effects which are produced in the sensitive film appear to be distinct from those taking place in superficial reduction. In examining the blacks or parts impressioned by the light, in the case of a series of progressive tones, it will be seen that they are formed of incrustations of a reticulated and granular texture—which is more accentuated the more the sensitive film has been acted upon by light—and that they have no appearance of granulation.

BLUE PRINTS ON PAPER, WOOD, ETC.

BY T. C. ROCHE.

THE following method gives fine blue prints on paper, wood, canvas, &c., and only requires washing to fix properly:—

First Solution.

Red prussiate of potash	...	120 grains
Water	...	2 ounces

Second Solution.

Ammonia-citrate of iron	...	2 ounces
Water	...	140 grains

The solutions should be made separately, and, when dissolved, mixed and filtered; then pour it into a dish, and float plain photographic paper on it for three or four minutes. When the paper is dried, it will keep for months. Print in the sun for eight or ten minutes; then simply wash the paper under the tap with running water. The result will be a strong blue picture on a white ground. The addition of a little gum-arabic water to the above solution, when made, will render the colour of the picture richer and the whites purer.

Correspondence.

PREVENTING DISCOLOURATION OF THE PRINTING BATH.

DEAR SIR,—I have tried various methods of purifying the printing bath when discoloured, and also of preventing its discolouring, for I found it such a nuisance being always obliged to purify, filter, and strengthen the bath. I found that though kaolin answered the purpose, it was troublesome and wasted silver, as also does permanganate of potash. At last, when about to give it up as a bad job, I hit upon the following formula, and which (if I may use the expression) I have found quite a blessing:—

Nitrate of silver	...	40 grains
Nitrate of soda	...	20 "
Ammonia	...	2 drops
Methylated spirits	...	2 drachms
Distilled water	...	1 ounce

* Read before the French Photographic Society.

I float the paper upon this bath for about three or four minutes. When I have finished sensitising my paper, I pour the solution back into the bottle, and next time it is perfectly clear and ready for use. I seldom filter the bath, as it does not require it; and I only occasionally add a few crystals of nitrate of silver and of nitrate of soda. I have been using my bath every day for a very long time, and it is now just as clear as when I first made it. It saves a very great deal of trouble, and does not waste silver, and the prints are finer in tone and quality than when I was always purifying my bath with kaolin, which I sometimes had to do after using it only once. I should, therefore, strongly recommend photographers to try this formula, as they would find it a great comfort, as well as economical. I keep my sensitised paper between sodaic sheets, and I should recommend others to do the same. I have tried citric acid and other methods; but I found them all more or less failures. Hoping this may be of use to others, I am, yours truly,
R. N. P.

COLOURING PHOTOGRAPHS IN PASTEL.

DEAR SIR,—Crayon painting, or painting with pastel colours, although more subject to injury from friction, is, I consider, very appropriate for colouring photographic enlargements executed in the style of vignette sketches, especially as the colours are applied dry; they are not likely to be affected by entering into chemical combination with the photographic substratum. Here, also, the shadows and drawing of the photograph will not be hidden unless a highly finished and complete painting in crayons is made; even then the photographic base will be found of great service. As sketches, I know of no style so easily executed by those whose artistic ability may not be great; of course, taste and facility of execution are required in all works of art, of however humble a description, to make them pleasing and agreeable. The paper of which the photograph is printed for this style of painting should be what is termed crayon paper, that is to say, paper having a rough surface or tooth, so that it may bite and retain sufficient of the crayon to produce a solid appearance.

The photographic print should be, in all cases, mounted upon the canvas properly strained on its frame as it is to remain when finished, for it is utterly impossible to mount a crayon drawing without the greatest risk of injury; neither can it be set without lowering its tone—i.e., the colours of the painting cannot be made to imbibe sufficient of any gummy or gelatinous substance to cause them to adhere to the paper and resist friction. Your readers will readily understand that crayon paintings should be so framed as not to touch the glass. The mount, or mat, in the case of smaller pictures, serves this purpose; but for larger productions the frames should have a double rabbet—in fact, it would be better if this sort of frame were used more generally; but it would prove more costly, as the glass must be first secured to the frame and the picture, either mounted on stout cardboard or frame. There is a style of painting, I believe, but little used, termed encaustic or wax painting; it is extremely durable, and I should think, by ingenious modifications, fine effects, resembling oil paintings, might be produced.

In this style, the shadows and drawing of the photograph would be necessary to form the foundation of the picture. The colours might be applied both back and front, and be assisted, in some cases, by the use of oil colours. The photograph should be printed upon strong paper, and strained on a frame without canvas or any other support, before painting it. Transparencies can be executed in this style for windows and fire screens with beautiful effect.—I am, dear sir, yours truly,

JAMES MARSH.

"PICKING UP" THE CARBON PROCESS.

SIR.—Will you allow me, as a constant reader of the *News*, to protest against the style of correspondence of which we have had some recent specimens in your pages, filling space which could be better occupied? Like most other portraitists at the present juncture I am interested in working carbon, and when I read the letter of "A Carbon Experimentalist" a few weeks ago, I looked eagerly for the replies. I am sorry to say that I was disappointed. An anonymous writer, styling himself "A Successful Worker," taunts the "Experimentalist" with writing an anonymous letter, and instead of giving the information which a successful worker may be supposed to possess, gives advice which is not asked for in place of such information. He also advises all who are in the same position as the experimentalist not to imagine they can "pick-up" carbon printing without paying for lessons. Of course there is justice enough in this. If information is worth having, it is worth paying for. But it is a fact, nevertheless, that in photography almost every distinguished man has "picked up" all he knows, without ever paying for a single lesson. The progress of photography, as we are constantly told, has been chiefly due to the free intercommunication of ideas in the journals. Is it good taste of this unknown self-styled successful worker to try to burke the system upon which the progress of photography is based? If, being successful, he is unwilling or unable to give information, let him not stand in the way of others who might do so, if they did not risk mixing with quarrelsome company. If your pages are to continue open to the enquiries of students, and the replies of the experienced workers, they should be closed to those who are more disposed to snub than to help. In hope of faring better than the first experimentalist, may I ask an answer to his queries, as

ONE ANXIOUS TO LEARN.

PS.—Will you allow me to express my deep thanks to Mr. Titcomb, and many such as he, willing to help, as well as able to work?

Talk in the Studio.

A NEW PHOTOGRAPHIC JOURNAL.—Another monthly journal devoted to photography has just been issued in the United States, under the title of the *St. Louis Practical Photographer*. It is conducted by Mr. J. H. Fitzgibbon, a practical photographer of upwards of thirty years' standing, and Permanent Secretary of the National Photographic Association, U.S. Mr. Fitzgibbon has been for many years a frequent and able contributor to photographic literature, and his first number promises exceedingly well. It is fresh, independent, and practical in tone, and whilst it abounds with good contributions (of which we give some examples in this issue of the *News*), the impress of the Editor's mind and intelligence pervade the whole number. A fine portrait of the Editor accompanies the first number, presenting a face which is at once shrewd, kindly, and manly. There is great room for such a journal in the States, and we wish it every success.

THE CONFERENCE.—The correspondent of the *Daily News*, writing from Constantinople, states that the members of the Conference have been photographed in a group by Adullah Freres, of that city, and that the likenesses of all the members are admirable.

LIFE-SIZE DIRECT PORTRAITS.—Reviewing the progress of the year, as illustrated at the Centennial Exhibition, the *Philadelphia Photographer* says:—"The most striking improvement—or departure from recognized practice—was the exhibit of Mr. J. B. Kent, of Rochester, N. Y., in which were portraits from life on negatives three feet or more in size, made direct, and printed by 'contact.' Mr. Kent has not yet condescended to tell us how this was done." Our readers will find some details of how it was done on p. 468 of our last volume.

PHOTOGRAPHY IN COURT (Robinson v. Worden).—A case of some importance to employers and assistants was recently heard in the Marylebone County Court. The plaintiff was a young professional photographer who advertised in the *PHOTOGRAPHIC NEWS* for a situation as assistant operator. The defendant, Mr. T. Worden, of Præd Street, answered, and references having been furnished, plaintiff entered into a five months' engagement. At the end of the second day the defendant intimated that he should not require plaintiff any longer. Plaintiff then brought an action for breach of contract. After some adjournments, the case came for hearing, when Mr. A. H. Bool, of Warwick Street, Pimlico, a former employer of plaintiff, gave evidence in favour of his competency. The defendant producing no witnesses to the contrary, his Honour gave judgment for the plaintiff, damages at £10 10s., with costs.

PHOTOGRAPHS OF THE SPECTRA OF VENUS AND A LYRAE.—Professor Henry Draper writes from New York as follows, under the above heading, to *Nature*:—"Since the spring of 1872, I have been making photographs of the spectra of the stars, planets, and moon, and particularly among the stars of a Lyrae and a Aquila, with my 28-inch reflector and 12-inch refractor. In the photograph of a Lyrae, bands or broad lines are visible in the violet and ultra-violet region, unlike anything in the solar spectrum. The research is difficult, and consumes time, because long exposures are necessary to impress the sensitive plate, and the atmosphere is rarely in the best condition. The image of a star or planet must be kept motionless for from ten to twenty minutes, and hence the driving-clock of the telescope is severely taxed. During last summer I obtained some good results, and in October took photographs of the spectrum of Venus, which show a large number of lines. I am now studying these pictures, and have submitted them to the inspection of several of my scientific friends, among others Professors Barker, Langley, Morton, and Silliman. There seems to be in the case of Venus a weakening of the spectrum towards H and above that line of the same character as that I have photographically observed to take place in the spectrum of the sun near sunset."

A SOLAR DISTILLERY.—M. Mouchot, whose steam boiler, heated by the sun's rays concentrated by a concave mirror, was described not long ago, recently exhibited to the French Academy of Sciences a new apparatus whereby by solar heat he distilled excellent brandy. The mirror was but 19.5 inches in diameter. A little over a quart of wine was placed in the boiler, and brought to boiling for fifteen minutes by the concentrated rays. The alcoholic vapour entered a tube placed in the centre of the boiler, traversed the supporting foot of the mirror, and descended into a room, where it condensed. The liquor was of remarkably good flavour, free from the disagreeable taste of alcohol peculiar to that obtained from wine in the usual way, and savouring strongly of the best cherry brandy. M. Mouchot afterward placed flowers and odoriferous leaves in his boiler, and made a variety of perfumes and essences. Finally leading the steam into a cooking apparatus, he prepared an entire dinner by the agency of the sun's heat.

PRINTING LEAVES.—In a recent article on "Nature Printing" the *Garden* describes various methods of obtaining copies of flowers and leaves from the objects themselves. The following, which is simple and easily tried, may be of interest to some of our readers:—"By those who have access to a laundry roller press, or an ordinary copying press, the following method of direct printing may be adopted: The best paper to use is ordinary wove paper without water-marks, such, in fact, as is used for book printing. Those who can afford to be luxurious may use thin drawing paper. First select the leaves, and then carefully press and dry them. If they be placed in a botanical press, care must be exercised not to put too great a pressure on the specimens at first, or they will be spoiled for printing. An old book is the best for drying the examples to be used; then get a small can of printer's or proof ink, and a small leather dabber, which can be bought for a few pence at any shop where wood engravers' materials are sold. Take a bit of ink about the size of a pea, and work it on a small piece of slate or glass with the dabber until it is perfectly smooth; a drop or two, not more, of linseed oil will assist the operation. Having worked the ink perfectly smooth, give the leaf a thin coating, being careful to spread it equally, not to dab it on in blotches, or the clear effect will be lost. Having applied the ink, take a sheet of paper of the size required, and lay the leaf ink down-

wards upon it, placing it between the leaves of an old book which must then be subjected to a moderate pressure in a copying press, or passed between the rollers of the washing machine. If a press be not at hand, lay the book on the floor and stand upon it for a few seconds, an operation which answers the same purpose. Impressions can be taken with greater rapidity by this process than by any other, and a very little practice will enable anyone possessing ordinary ingenuity to succeed in producing them. Soft book paper is the best for the purpose, and, previous to using it, place a few sheets between damp blotting-paper, which causes it to take the ink still more readily. At first you will find that you lay too much ink on the leaf, which then produces too dense an impression. After a little practice you will know how much ink to lay on each description of leaf. If you find the impression too black, use the leaf once again without inking it. If the midrib of the leaf be too thick, so that the part near it does not come into contact with the paper, it must be shaved down with a sharp knife. Composite leaves, as of the umbelliferae, should be divided, and their parts printed separately; other details will soon be learnt by practice."

To Correspondents.

BACKGROUND.—When a distemper background gets seriously stained with wet, the best remedy is recolouring, as it is difficult to repair a portion without showing the marks of junction. Wash the whole first with a clean brush, and then apply fresh distemper colour over the whole.

B. D. A.—The advertisement to which you allude had reference to a special mode of lighting only, and to providing roof and side lights to suit studio to order. It did not consist of a studio complete. The question as to the advisability of erecting a temporary studio, with a view to its eventual removal, is one upon which we cannot advise; it must depend so much upon local circumstances. Probably a local builder will aid you best.

BRIERLEY.—It was scarcely wise, in making wooden vessels for holding silver and other delicate solutions, to apply red lead to the joints; for if the black or white varnish with which the inside of the wood is treated wear off or chip off, and expose any portion of the lead, it will act injuriously. Pitch or paraffine is found best for the lining of a wooden bath. The varnish of collodion and linseed oil, which we have occasionally recommended in the News for treating wooden dishes, should be applied over paper, with which the wooden tray is first lined, to cover all cracks and joints. For toning, we should advise you to use a white earthenware dish, as a degree of strict cleanliness is required with the gold bath which could scarcely be seen in anything but clean white earthenware. Your bath and dish for fixing may be tried without much fear. 2. Your quarter-plate lens will probably serve your purpose for card portraits for the present, and the negatives may be taken on quarter-plate glasses, taking them, of course, of proportions suitable for card portraits. The simplest and cheapest form of printing frame will answer your purpose. Any dealer in photographic materials will supply you. You will understand their use without difficulty. The negative is laid in the frame with its glass side outwards; the sensitive paper, being dry, is laid with its face in contact with the face of the negative, the back placed upon the paper, and fastened. The back of the negative is then exposed to the light, and printing begins. When you think it is nearly done, you open one-half of the back of the frame, and examine the actual progress of the print. The other half, being kept fast, prevents the paper moving from its true position on the negative. Quarter-plate printing frames will, of course, suit your purpose.

A. B.—We fear that we cannot help you to a remedy. It is probable that, in any case, the matter would simply stand as a debt. The announcement you suggest could not with propriety appear.

J. M. STORR.—Thanks for the suggestion. We frequently do so when any information of general interest is under attention; but very many of the queries are essentially personal in their character. Even when various readers wish for similar information, there is often something special in its precise bearing which renders a detailed answer to each desirable.

NATHANIEL SYDNEY.—The powder process is valuable for many purposes. It is excellent for reproducing negatives; it is very useful for adding backgrounds to negatives, and otherwise improving them. It is excellent in the hands of an artist for producing prints on paper, or on opal glass. You will find various articles on the subject in our volume for 1874, and in our YEAR-BOOK for 1875. As to how far it will serve your purpose to learn the process, you will be best able to judge.

R. D. F.—The proportion of any resin to be used in making varnishes depends much upon circumstances. For a moderately thick varnish from forty to fifty grains per ounce of solvents; for a thin varnish from twenty to thirty grains. Some resins produce a more limpid varnish than others, and admit of the use of a larger proportion of resin, without making the varnish too thick. We do not counsel amateur varnish making, because the selection of resins and solvents, and their proper mixture, requires much experience, and failure is often a serious matter.

J. H.—We have no doubt that if published the card would sell. It is very pretty.

H. M. (Amateur).—The lantern slide you forward has not, we think, been toned at all. It is the colour often produced by developing with pyrogallie acid. A solution containing two grains of pyrogallie acid and thirty minims of acetic acid in an ounce of water will give a similar tone. Bath and collodion should be in good condition, and exposure sufficient. An emulsion plate, with a thin image brought out by alkaline development, and redeveloped with above and a little silver, would give you a similar tone. A grey image may be brought to a similar tone by bi-chloride of mercury, followed by sulphide of ammonium very dilute. 2. Collodion transparencies which are mounted under glass need not be varnished; but, if you prefer it, that known as "crystal" varnish answers very well. 3. We are not sufficiently versed in the prices and relative qualities of magic lanterns to advise. The selection we should recommend, but it is not very cheap. Your negative has been posted. It was cracked when we received it.

W. COLQUHOUN.—Many thanks. The colour is excellent.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR DECEMBER.

BY WILLIAM HENRY WATSON, F.G.S., F.M.S.

Observations taken at Braystones, near Whitby, 36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	29.12	29.06	28.97	47°	49.5	49.5	Rain a.m. and p.m.
2	28.97	28.90	29.01	46.5	49	48	Rain a.m. and p.m. Very windy at night
3	—	28.57	28.40	52	53	49	Rain all day. Very windy
4	28.26	28.35	28.28	53.5	53	49	Rain a.m. and p.m.
5	28.58	28.50	28.52	46	50	49	Rain p.m.
6	28.58	28.63	28.90	44	50.5	46.5	Rain afternoon and night. Very stormy
7	29.00	29.10	29.19	48.5	50.5	39	Rain this morning
8	29.47	29.57	29.87	39	46	48	Fair and sunny
9	29.37	29.60	29.97	46	46	44	A little rain a.m. and p.m.
10	29.60	29.79	29.75	46	48	47	Rain p.m.
11	29.70	29.65	29.50	45	46	46	Fair, but very gloomy
12	29.18	29.20	29.27	46	49	45	Rain morning and evening
13	29.35	29.35	29.40	34	42	40	Showers this afternoon
14	29.39	29.38	29.56	42.5	44	42	Fair but gloomy
15	29.56	29.50	29.48	42	48	41	A little rain this evening
16	30.40	30.42	30.40	45	46.5	44	Showers all day
17	29.38	29.34	29.20	45	46	44	Showers all day
18	29.09	28.96	28.97	42.5	45	45	Rain a.m.
19	28.84	28.80	28.63	42	44	45	Showers a.m. and p.m.
20	28.45	28.40	28.46	41	43	41	Rain a.m. and p.m.
21	28.48	28.45	28.50	42	43	40	Rain a.m. and p.m.
22	28.65	28.70	28.83	37	40	38	Fair, but gloomy
23	28.90	29.00	29.10	38	34	36	Fair but gloomy
24	29.15	29.29	29.30	32	36	38	Stead morning and afternoon
25	29.41	29.50	29.63	30	38	34	Fair and sunny
26	29.62	29.60	29.51	30.5	32	35	Very windy. Heavy snow-storm at night
27	29.20	29.18	29.10	39	46	46	Rain a.m. and p.m.
28	29.21	29.18	29.27	46	54	45	Rain a.m. and p.m.
29	29.37	29.32	29.06	43	46	47	Showers a.m. and p.m.
30	29.16	29.20	29.08	45	51	45	Rain all day
31	28.70	28.70	28.78	51	53	49	Heavy rain with wind a.m. and p.m.

Summary.				Mornings. Noons. Nights.		
Highest temperature observed	...	...	...	55°	58°	45°
Lowest	...	...	...	29°	31°	29°
Mean	...	...	...	43°	46°	44°
Mean of all observations	...	...	...	44°		
Number of days on which rain fell	...	...	...	...	...	26
Number of fair days	...	...	...	...	...	6
Number of fair days gloomy	...	...	...	...	...	4
Number of fair days sunny	...	...	...	...	...	2

NOTE.—By referring to the columns of barometric pressure it will be seen that it was exceedingly low on the 4th, and that during the month the barometric pressure was very variable. The mean temperatures are so considerably above the average for the month of December.

The Photographic News, January 26, 1877.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.****PHOTOGRAPHY AT THE MILITARY STAFF COLLEGE.—MORE PHOTOGRAPHIC PUBLICATIONS.—PHOTOGRAPHIC POISONS AND THEIR ANTIDOTES.**

Photography at the Military Staff College.—Most of the European Powers, as our readers are well aware, avail themselves of photography in connection with military affairs. In this country there are three establishments intimately connected with the art—at Chatham, Southampton, and Woolwich, and in France, if we may judge by the productions exhibited at the last Photographic Exhibition held in Paris, the art is cultivated to a no less extent by the Ministry of War of that country. In Russia, Austria, and Portugal, military photography is well known; and although Germany has no official establishment of the kind at Berlin or elsewhere, still that military nation was not slow to appreciate the aid that photography can lend to the soldier upon occasion, and at the outbreak of the Franco-German war a staff of photographers was at once organized, which successively did good and valuable work in front of Strasburg and Paris. In this country we have recently gone a step further, and have included photography among the subjects taught at the Military Staff College at Sandhurst, officers who prove themselves to be proficient in the art receiving an extra certificate. The Staff College is established for the instruction of officers who may desire to qualify for staff appointments. Officers in any regiment may compete, and a score of the most proficient are chosen as students. These remain at Sandhurst for two years, during which period they have the advantage of studying under a staff of qualified professors, and at the end of their term of study, if they show sufficient knowledge of their duties, they receive certificates of qualification, and are eligible for appointments on the staff. Such appointments are naturally enough regarded as great prizes by all young soldiers, and there is usually a very spirited competition for admission to the college in the first instance. There are of course certain subjects in which all students must satisfy the examiners; they possess a thorough knowledge, but beyond these qualifying subjects, there are others which the student may take up of his own choice, and pass an examination in. Among these voluntary subjects is classical photography, and we find that it is one which is eagerly embraced by students. A knowledge of photography is considered of so much importance, that its cultivation is encouraged by the Horse Guards as much as possible. For reconnoitring purposes, for mapping, and for illustrating military reports, the camera is of the greatest assistance, and thus it is very desirable indeed that staff officers should have some acquaintance with the art. At the last examination of students quitting the Staff College, we see that out of twelve officers who were examined in voluntary subjects, four proved to be well grounded in photography, and to have obtained certificates to this effect. Thus we are told that Capt. Grover, R.E., passed "a good examination in photography, and a very good examination in geology and experimental sciences." Capt. Lloyd, 76 F., "a very good examination in photography;" Capt. Money, 87 F., "a good examination in photography;" Captain Murray, 89 F., "a good examination in French and photography." We believe that in this respect Great Britain is in the van, and that our army authorities are the first to recognise the utility of photography so far as to encourage a study of it among staff officers. Dr. Atkinson, F.R.S., who is the professor of chemistry at the Staff College, has given the practice of photography considerable attention, and for some time past has afforded demonstrations in the art; but it is only recently, as we have pointed out, that the military students have been permitted to take photography for one of the subjects of their examination.

More Photographic Publications.—According to the *Athenaeum* we are to have two more photographic publications of importance, which will be published respectively by Messrs. Sampson Low and Co., and Messrs. Proctor and Co. *Street Life in London* is to be the title of one of these periodicals, and it is to be issued under the auspices of John Thomson, F.R.G.S., and Adolphe Smith. The idea is, to present those interested, with a series of pictures illustrating London life, and each part is to contain three photographs, printed, we suppose, by the Woodburytype process. We hardly see how such a periodical can possibly live a long time, for street types in London are not very numerous, or, at any rate, such as would interest are not, and therefore the task of portraying London street-folk must soon come to an end. The other work is to be called *The Portrait*, to appear weekly at a shilling per number. It will contain a series of portraits, also, we presume, printed in permanent pigments; among the earlier portraits published will be those of the Earl of Beaconsfield, Mr. Swinburne, Mr. William Black, Mr. Woolner, B.A., General Tcherniaeff, M. Tourguenief, &c. According to the prospectus issued, the periodical will "illustrate the time we live in by means of photographs and memoirs of those who adorn or disgrace it," so that we may expect to see the portraits of notoriety as well as celebrities in its pages.

Photographic Poisons and their Antidotes.—Although it is impossible, perhaps, for photographers to bear in mind all the antidotes corresponding to the poisons they daily employ, still, with a very little trouble, they may fix in their memories a few simple facts which might help them in instances of accidental or intentional poisoning. Some days ago the well known Paris actress, Madame Dica Pelté, swallowed by accident some solution of corrosive sublimate. Medical aid was, of course, sent for, and while awaiting it the lady's mother wisely bethought herself to administer a cup of milk, and this antidote, there is every reason to believe, saved the daughter's life. Corrosive sublimate or bichloride of mercury is a salt to be found in every photographic studio, being commonly employed for intensifying negatives; it is a most violent poison, but the photographer has nearly always an efficient antidote ready in albumen or white of egg. If photographers would bear in mind the compounds, and their nature, formed under certain circumstances, they would, in most cases of poisoning, be ready to help themselves. Thus, if they will remember that mercury salts for the most part form with albumen an insoluble compound, as they do with the caseine contained in milk, it must necessarily occur to them that a patient poisoned by mercury would do well to swallow a substance which will combine with and render the mercury harmless. An emetic quickly administered is, perhaps, the best thing, first of all, and then the antidote should follow as quickly as possible. Again, take cyanide of potassium, which is also a most terrible poison. Most photographers know enough about chemistry to be aware that it forms with iron salts—the perchloride is best, but the ordinary proto-sulphate will do—the comparatively harmless compound, Prussian blue, and therefore the administration of iron is a good thing in cases of poisoning of this kind. Salts of silver, to give a third instance, may in the same way be counteracted by the administration of egg or milk (with which they form an insoluble compound), or of common salt, which, as every photographer knows, precipitates the salt as innocuous chloride. Antidotes for other mineral poisons are not more difficult to bear in mind, and it is the duty, therefore, of photographers to make themselves acquainted with them. We give these hints, not for the purpose of showing that a medical man is unnecessary in such cases, for his assistance should be invoked without a moment's delay, but with the view simply of showing how photographers may help themselves on an emergency.

NOTE ON THE SO-CALLED RETICULATION OF CARBON TISSUE.

BY H. BADEN PRITCHARD.*

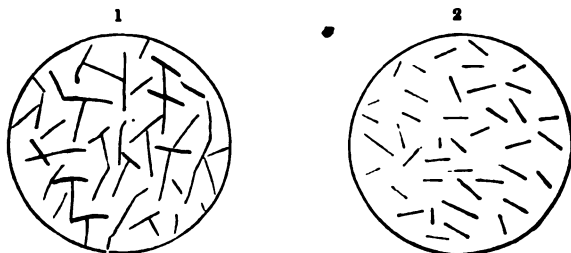
THE phenomenon of reticulation must not be confounded with that of insolubility; the former is, to a certain extent, a curable defect, while the latter is not. A sheet of tissue which exhibits a uniform granulation of black particles over its surface on development may be regarded as having become, to a certain degree, insoluble previously to printing, and is valueless.

Putting on one side, for a moment, reticulation as it is found in practice, I would point out that the phenomenon is to be produced artificially in two ways:—

1. By maintaining the tissue at a warm temperature (say 100° Fah.) for a little while; fifteen minutes will suffice.

2. By placing the tissue under an air-pump for twenty-four hours, with plenty of sulphuric acid to absorb the moisture.

I have closely examined under a microscope, using a quarter-inch object glass, the phenomenon produced under these two conditions, and I append herewith drawings of it, as these two phases appear enlarged.



Heated Tissue.

Air-dried Tissue.

It will be observed that the markings are more exaggerated when the tissue has been heated than when it has been subjected to the more uniformly drying action of the air-pump. In the former case the reticulation has proceeded so far that I should term the defect incurable; but in the other instance, with caution, the tissue could be brought back to its normal condition.

When reticulation has proceeded as far as in the heated specimen I show, the appearance of the film under the microscope (after development, of course) is very similar indeed to the lifting of the film of a collodion negative, and, like the latter, the raised portions begin to crack and open when the film becomes thoroughly dry. In this case the lines run into one another like the cross markings on one's hands. I know of nothing that will mend matters under these circumstances.

Where, however, the reticulation has not proceeded so far, as in the case of No. 2 specimen, and the defect is confined to short lines or marks which do not run into one another, then the tissue may be made use of under certain circumstances.

Reticulation, then, in my opinion, is due to the gelatine in the tissue having been robbed of too much of its moisture, and having undergone a change from which it does not frequently recover, and then only with difficulty. It has suffered contraction to such an extent, that it is well nigh impossible to bring it back to its normal condition. The only way is to develop upon a basis that is not fixed. The single transfer process, by reason of the slippery character of the basis, permits the expansion again of the tissue, and this particular method favours, therefore, the recovery of the film to a great degree. It is the same with waxed plates (zinc, for instance), the coolness of the metal in this case also having a tendency to rehabilitate the gelatine; but a collodion film does not allow of the gelatine moving in this manner, and hence we find reticulation occurs most fre-

quently when collodion is employed as development basis, for the image will not stir from the firm grip it has taken upon the collodion. On some occasions I have found tissue useless for development on glass by reason of reticulation, which developed without a trace of that phenomenon on cold zinc plates well waxed.

Water as cold as possible should be employed in soaking the exposed tissue first of all, and an immersion for a few minutes will not do harm in hot weather; the development is then undertaken in water not too hot (the temperature varies much with the nature of the tissue and time of year), and a final rinse in hotter water still is sometimes beneficial in securing a clearer image and preventing any "swimming" of the picture from soluble pigment that may not have been washed away.

Too much stress cannot, in my opinion, be laid upon printing and preserving sensitized tissue in a cool locality.

NOTE ON CARBON PRINTING.

BY COL. H. STUART WORTLEY.*

HAVING now worked the Lambertype process for the past fourteen months, I am thoroughly satisfied with it. I had printed a good deal in carbon before, but never to my satisfaction. There are difficulties in it, of course, and my work being all of a large size I have had a fair share of them. The tissue itself is now very good, and any one who cannot work with it must blame only himself. The following few remarks may be of use:—I use the bichromate bath of various strengths, according to the density of my negatives, and always with the addition of ammonia. This addition has always been printed in M. Lambert's formulae, though lately erroneously credited to another gentleman by one writer.†

During last summer I invariably iced the bichromate bath, and met with no difficulty whatever on account of the temperature. I always pour a solution of wax over the plate, and never rub wax on the plate after the method of M. Lambert. Lastly, I mention that it will be found of great value to wash the collodion in tepid water in winter, as dipping it in cold water gives a tendency to break away.

LIGHT, EXPOSURE, AND DEVELOPMENT.

BY H. A. H. DANIEL.‡

AND now I will say a word or two on "how to expose." For views, I maintain that always, if practicable, a *long exposure and weak developer* give far the best results. I am of opinion that when a strong developer is used there is a much greater likelihood of hardness, and as a strong developer requires a quick exposure, I do think that such detail is given as with a long exposure. That is to say, in taking, for instance, the case of a landscape with fairly-lighted parts, and also very dark portions in the depths of the foliage, presuming a short exposure be given, and a strong developer used, I believe that the well-lighted parts assume a certain degree of hardness, and the dark portions of foliage do not contain so much detail. But suppose we use a weak developer, and give a long exposure, the details in the deep shadows get a longer time for impression on the film, and can be brought out slowly but surely by building up the negative; at the same time the weakness of the developer prevents any hardness in the well-lighted parts. But some may say, "If you give a short exposure, your developer is in accordance with it, and so the results should be equal." Theory may assert so, but I most decidedly affirm that theory in that case is false, and does not, as a matter of fact, harmonize with

* The addition of liquid ammonia to the solution of bichromate of potash was first suggested ten years ago in the work on Carbon Printing by the Editor of this Journal. In the early days of the process it was, we believe, often used by Mr. Swan.—Ed.

‡ Continued from page 27.

* Read before the Photographic Society of Great Britain.

practice and result. The picture on the table labelled No. 3 had seven minutes' exposure, and was developed with a weak developer, that is to say, about twenty grains, five grains more than I generally use, the subject being a remarkably dark one. In making exposures, there is one thing that should be continually studied: it is to endeavour to gain a tolerably accurate idea of the actinic power or value of different colours in nature, such as the light and dark greens, browns, greys, yellows, and reds. This can only be acquired by carefully noting the exposures, and examining, afterwards, the negatives, carrying the landscape in the eye as well as possible. By so doing a far better idea of the required length of exposure is obtained than by any other method I am acquainted with. We cannot rely on apparently equally lighted subjects, or recollecting the exposure of one subject and applying it to another. What appear to be equally lighted subjects are very often not so. By making this a little point of study, many a negative will be saved from under- or over-exposure. Again, if the subject be a very considerable distance from the tent, never should the wet blotting-paper of the back be omitted.

In a great number of cases a mistake is made as to the manner of uncapping the lens. We will suppose that the view comprises foreground, sky, and one of the sides of the picture in shadow. In uncapping the lens, the foreground and dark side should be exposed first, the sky being exposed last. If the dark side of the subject be on the right you would uncup the lens diagonally, beginning at the lower right hand corner, and coming gradually across obliquely, the effect being that the foreground and dark side would be the first to act on the sensitive plate, and so on later and later, till you came to the sky. The cap should be replaced in the same manner, only *vice versa*, beginning where you leave off. What often affords the greatest difficulty is to get well depicted a prettily clouded sky, and yet well expose the other parts of the picture. A most ingenious and useful piece of apparatus for effecting this object is a new kind of sky-shade, lately introduced, with finger-like projections which can be lengthened or shortened to follow approximately the outline of the sky, so that, prior to exposure, the sky can be shielded, and after half or more of the exposure has taken place, the shade removed, and the sky exposed. I have never used it, but have been told very fine cloud effects can be obtained in the negative by its help; but I have attained somewhat the same end by using the cap of the lens judiciously in a similar manner.

Relative to life in a picture, a little often adds greatly to the naturalness and reality of it, but I do not like to see it introduced as a sort of habit; but this is one more point which must remain with the operator's discrimination and good judgment. As to how to expose for portraits, I will just make a remark or two; but will not say much, as far more able pens than mine have written as to this, and I fear I have already tired you. One point that is very important is the position of the camera, which, if not carefully arranged, may ruin an otherwise good picture. If the camera be too high, so that it requires to be greatly depressed to embrace the subject, the effect is to give an entirely wrong impression of the pose, causing the head to appear as bent down, and showing far too much of the top of it. On the other hand, if the camera be so low as to be pointed upward to the sitter, the consequences are very disastrous, and far from flattering, producing the effect of a turned-up nose in an aquiline, and distorting the chin, and giving the impression that you are peering up underneath the chin, nose, and eyes, the effect being ludicrous and truly horrible. I think it will be proved that the best position for the camera is a little above the level of the sitter's eyes for three-quarter-length figures, and a shade lower for vignettes. There seems to be a rather prevailing opinion that portraits taken with direct sunlight effects are quite out of the question,

and not to be thought of. If more photographers would occasionally produce such, providing they be artistic, I think I can safely affirm that they would become to a certain extent popular. I have seen some most excellent pictures with such effects; one taken by a friend of mine in which the sitter, a gentleman, had a straw hat on. The sun was in such a position that it cast a sharp moderate shadow round the face, the straw hat entirely protecting the eyes from the sun's rays. There was full detail, and yet a most charming sunny day effect of an extremely pleasing character.

But of course the same thing may be done with good taste and judgment, and without any, in which latter case I can imagine a shocking effect. But they may be made with such a style of lighting very pleasing and attractive, without one atom of harshness, and I would recommend some of the members next season to try it. I would, while in this section, state my belief in what has been much discussed—viz., supplementary exposures to yellow light. I have found it more than once an assistance. No. 4 is an instance. That picture of a horse (a colour, by the way, not conducing to short exposure) was taken on a very dull, rainy, autumn day, with an exposure of a little over three seconds, which, of itself, could not possibly have been enough, but I placed it close to my tent window for three minutes, and the result was successful. Of course, the picture is not all that might be desired in all respects, but it is just what would be expected on such a day.

(To be Continued.)

THE BASIS OF PRINTING IN CARBON.*

A black mineral called chrome iron-ore occurs in nature, especially in Sweden and America. If this is fused with carbonate and nitrate of potash, a beautiful orange-red salt is formed, which is bichromate of potash. It consists, as implied by the name, of chromic acid and potash. Chromic acid and its salts are sensitive to light. Neither pure chromic acid nor chromate of potash are changed by light; they can be exposed for years to the sunlight without any decomposition being perceived; but as soon as a body is present that can unite with oxygen—as wood-fibre, paper, &c.—the light immediately produces its effect.

Gelatine is insoluble in cold water, but it absorbs cold water, and thereby swells. It dissolves in warm water, and if to this warm solution be added alum, or a salt of the oxide of chromium, or chrome alum, the gelatine becomes insoluble in water. Bichromate of potash and gelatine can be dissolved together in warm water in the dark, without the gelatine suffering any change from the chromate. If a sheet of paper be covered with such a solution of gelatine and bichromate of potash, and the film be allowed to dry, it becomes firm, and yet remains soluble in water as long as it is kept in the dark; but as soon as the film is exposed to the light the bichromate of potash is reduced to oxide of chromium, and this tans the film of gelatine; that is, makes it insoluble in water. Paper is coated with this preparation of gelatine and bichromate of potash coloured with a pigment, for example, lamp black; this paper is then exposed under a negative, the film is washed in hot water, which dissolves those parts of the gelatine unaffected by the light, whilst the insoluble parts retain their colouring matter, and thus form a picture.

The action of the light does not always penetrate the whole thickness of the film; the half-tones, therefore, have no support, and are destroyed in washing. Before immersing the films in hot water, it is necessary to transfer them to a sheet of paper, which is pressed in the dark on the coloured film of gelatine, and then the whole is plunged into hot water; the half-tones adhere to the paper pressed upon

* Extract from "The Chemistry of Light," by Dr. E. Voeltz (B. S. King & Co.).

an, and the image appears uninjured on it. The picture of course, reversed; therefore, if the reversed position is sired, the picture must be again transferred.

The moist gelatine film is placed, after exposure, upon a smooth zinc plate, to which, on drying, it becomes very firmly attached. The print thus attached to the zinc, immersed in warm water, the paper becomes detached, and the developed image adheres to the zinc plate. A sheet of white paper is now fastened upon the zinc plate and is allowed to dry. The gelatine picture adheres firmly to this paper, and may be detached from the zinc plate. The picture thus appears unreversed upon the paper.

SUGGESTIONS ON THE USE OF BACKGROUNDS.

BY L. W. SEAVY.*

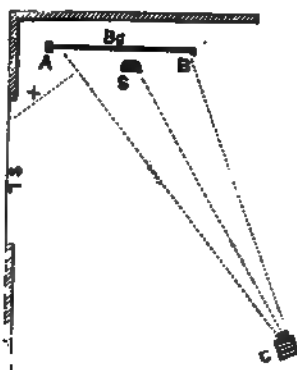
BACKGROUNDS especially adapted for standing subjects seldom answer for sitting, for the reason that in exterior the horizon line is too high, and foreground not understood when seen without the middle distance and sky.

Six weeks ago I painted a background, expressly for use with a rail fence and bars, and in order that some of the distant landscape might be seen above the fence, I made the horizon high—represented a hill sloping towards the subject; farm houses embowered in the trees, &c.

After a week of trial, the photographer complained that there was nothing in the background; that it was too indifferent. On examination, I found that he was working it so far out of focus that it was scarcely seen on the plate, and that his trials, with but one or two exceptions, had been with sitting figures, and even those seated as low as possible.

It is safe to place a wall-painted background as near the subject as the head-rest will allow.

Quite recently a city patron complained that his ground was too light; that there was no strength in it; that the shadows were not near as strong as usual; and that he could not get sufficient detail to show the design. In his case he was working in a new light—very low top and side—and was using his material as per the below ground plan:—

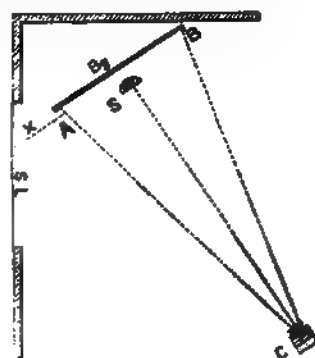


Observe how much further out of focus the background is at A than at B. Then note that the light which enters the side-light is reflected to some degree (see dotted lines A X), and further consider the nearness of the background to the flood of light entering near X, which alone would take out considerable detail.

In what position, then, should the background be placed in order that it may affect the plate to its full value, the camera and subject remaining in the same position? The

* *Practical Photographer.*

following plan indicates the position which was suggested, and which effectually overcame the difficulties:—



It, therefore, follows that if you wish to make your background lighter than when worked at right angles to the side-light and to the camera, you should turn it toward the light, even at the expense of the detail. On the contrary, a slight turning from the light and from the camera will produce the opposite effect, still losing some detail.

Backgrounds with patterns, ornaments or straight lines, should not be used for heads or busts.

Don't use artificial or real rocks with balustrades.

Don't put base-boards on landscapes or interior backgrounds. They may be used with plain ones; still the mouldings are apt to take an objectionably high light.

Summer landscapes are hardly appropriate for ladies in furs, and gentlemen in heavy overcoats and fur caps.

In undertaking the use of set-pieces representing interiors, remember that consistency in lighting is necessary. The light should appear to come from windows and open doors, and not from the ceilings, as in a case lately under observation.

Many a theatrical set-scene is made effective and natural by the judicious use of lights.

Vertical lines should never intersect the figure in the centre of the head, or at its side, or the point of the shoulders.

Horizontal lines should never cross a figure at the neck, but should be below the shoulder, above or below the waist. Diagonal lines, such as falling shadows, or lines in architecture, should not intersect the figure at the point of the shoulder, elbow or waist.

In using backgrounds with indications of patterns on the walls, see that none of the lines seem to spring from the figure.

Elaborate backgrounds, carved furniture, curtains of heavy stuffs with rich borders, give an air of finish to the plainest photograph.

Study Chapman's American Drawing Book, Burnett's Composition, and read as much art and photographic literature as your time will permit and your means afford.

The illustrated papers and magazines will suggest many valuable ideas for composition, posing, and lighting.

Aim high, and maintain the dignity of your profession.

THE NEGATIVE BATH AND ITS TREATMENT

BY E. H. TRAIN, OF MONTANA.*

THE negative bath should be thirty-five or forty grains of silver to the ounce, and the more ounces the better. Small baths are too easily contaminated, and change rapidly. Having made your bath as large as your camera will admit, iodize it to two-thirds saturation, and let it to the sun twelve hours or more, or, if you cannot do the same thing, make it of water that has been cleared by adding a few grains of nitrate of silver plate, and if it fogs, add nitric acid, just —

it work clear, and then fool with it just as little as possible. Put nothing into it but good, clean plates; give it nothing but rest and work; never strengthen, neither add to nor take from it; skim it with blotting or filtering paper whenever there appears to be a scum on the surface, and filter only when it shows the need of it. A large bath thus treated should never fail to produce good results with any good collodion (for my formula, see in *Monies* for 1876), and the ordinary iron developer (say thirty grains of iron and an equal amount of acetic acid No. 8 to the ounce of water, and just enough alcohol to make it flow) until it has come to contain too much alcohol, or has become too small to cover your plate. This is my way to renovate and commence anew.

To renovate a bath, put it in an evaporating dish, and thoroughly neutralize with bicarbonate of soda, or what is much better, carbonate of silver made by throwing down some of your old bath with bicarbonate of soda, and washing the precipitate in four or five waters, and boil to one-third its original volume; let cool; filter; then add clear distilled water, enough to make the required volume; and lastly, strengthen to thirty-five or forty grains by adding adding crystallized nitrate of silver, and make slightly acid with nitric acid. This should work clear and nice. But if it should show any inclination of fog, add more acid until it works clear. If an old bath should not turn very black in boiling, be sure you have not neutralized it. If, for any reason, a bath should refuse to yield good results with the above treatment, the best remedy, I think, is fusing. To do this, evaporate to dryness in a sand bath (any old pan filled with sand to set your evaporating dish in will do), and heat until the smoking mass will ignite paper; then set your sand bath off the fire, and let it all cool together. Do not heat too hot, or you will have metallic silver.

Many of the brethren are troubled with a white deposit coming on the plate in hot weather. To avoid this, keep your chemicals cool, and let as little time as may be elapse between sensitizing and developing your plate; and if you still can not avoid it, it may be necessary to weaken your bath a little, but it ought not.

Another frequent annoyance in hot weather is a marbled appearance in the film, showing on the back side of the negative, and also showing in the print. This can be avoided by immersing the plate slowly—much slower than usual—but, of course, the motion must be steady and continuous to avoid streaks.

Now, a word about preparing plates, and I am through. Beat your albumen thoroughly; make it about twelve or fifteen parts water to one of albumen, and filter well. Immerse your plates for a few hours in dilute nitric acid; then wash well under the tap, and set in a bucket of water until ready to albumenize; then wash again; rinse with distilled water, and flow with albumen. Be sure your plates are kept wet from the time they leave the acid until they are flowed; wash well, and keep the dust off, and your plates will be clean and in good order for working.

Recent Patents.

THE PLATINUM PRINTING PROCESS.

The following is the text of Mr. Willis's specification describing the mode of printing in salts of platinum, for which he has obtained a patent:—

This invention has for its object improvements in the chemical treatment of the surfaces of paper, wood, and other suitable materials employed for receiving images from photographic negatives, or from any other object that may be inter-

posed between the light and such prepared paper or other surface. For this purpose, according to my invention, I apply to surfaces of paper, wood, and other suitable materials (by either one or more coatings) solutions or coatings of simple or compound salts of platinum, iridium, or gold, or a mixture of such salts. After this has dried, I sometimes apply another coating of a salt or salts of other metals. I then coat the material again, using a solution of ferric oxalate, or tartrate, or a combination of these salts with others, and again dry. I then expose the coated surface to light under a photographic negative, or other suitable object, till a faint brown image appears; after this I apply to the coated surface a solution of the neutral oxalate of potassium or other suitable oxalate, which speedily changes the brown tints to black ones. I then wash the surface thus treated for a short time in a dilute acid, and finally wash in water, but I sometimes immerse the surface in a solution of chloride of sodium, or hyposulphite of sodium, or other suitable salt, before giving it the final wash in water.

The following are several examples of the operations and manner in which I employ some of the chemicals above referred to in carrying my invention into practice:—

1st method. I coat paper with a solution of chloro-platinite of potassium containing ten grains of the salt to one ounce of water. After drying the paper, I coat it again with a solution of the nitrate of lead, forty grains of the salt to one ounce of water, and dry it again. I then coat it a third time with a solution composed of ferric oxalate, sixty grains to one ounce of water, with as little oxalic acid as is sufficient to render the ferric oxalate soluble. I then dry the paper, and expose it to light under a negative. On removing it from the negative, I float it, face downwards, on a hot solution of potassic oxalate. I then wash it in a weak solution of oxalic acid, then in plain water, and finish by immersing it in a solution of hyposulphite of soda, followed by a slight wash in plain water.

2nd method. In this method I proceed as in the first, but substitute an eight-grain solution of nitrate of silver for the nitrate of lead, and after removing the prints from the weak solution of oxalic acid, I finish them by an immersion in either a strong solution of chloride of sodium, or in a weak solution of that salt, followed by a weak solution of ammonia, supplemented in both cases by a slight wash in plain water.

3rd method. I coat paper with a solution of platinum bromide, twelve grains to one ounce of water, and dry. I then coat it with a strong solution of ferric tartrate, and dry. I next expose this paper to light under a negative, and afterwards float it, face downwards, on a hot solution of potassic oxalate. I then immerse it in a weak solution of oxalic acid, and finish by washing it in plain water.

I occasionally vary the preceding operations, or invert their order, or omit one or more of them. I would remark that I do not intend to confine myself to the use of aqueous solutions of the chemicals herein-before referred to, as the salts may be dissolved, and used with any suitable solvent. I sometimes mix two or more of the salts used for coating the paper or other surface before application.

Having thus fully described the nature of my improvements, and the manner of carrying the same into practice, what I claim for the production (on suitable surfaces) of photographic pictures in platinum, iridium, and other metals, is the application of solutions of potassic, ammoniac, or other suitable oxalate, to such surfaces after they have been exposed to light under a negative or other suitable object, and which surfaces have been coated previous to such insolation with ferric and with other salts, substantially in the manner herein-before described.

ANILINE COLOURS IN ART.—At a recent meeting of the Manchester Literary and Philosophical Society a letter was read from Mr. Joseph Siebotham, in which he calls attention to the fact of the growing use of the aniline colours for tinting photographs. He finds they are being extensively used in paintings and water-colour drawings, and the colours regularly sold for that purpose. Any one who knows the speedy alteration by light of nearly all of these colours will protest against their use, and a statement of this, with the authority of some of our chemists, would probably have the effect of causing them to be discontinued by all artists who care to think that their works should last more than a single year.—*Nature*.

The Photographic News.

Vol. XXI. No. 960—JANUARY 26, 1877.

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HEALTH OF PHOTOGRAPHERS.

THE question often arises as to whether the practice of photography is *per se* an unhealthy pursuit. We have already stated a conviction that, pursued with legitimate precautions and ordinary prudence, it is not more unhealthy than a large number of industries involving close application, some strain on the nervous system, and possible contact with dangerous substances. It is less injurious than many chemical manufactures, grinding trades, electroplating, silvering looking-glasses, and others of the occupations recognized as tending to shorten life. It may, in fact, be pursued so as to be free from danger or injury to life or constitution. But as it undoubtedly involves conditions requiring the exercise of care and prudence, it is not out of course to raise a warning note now and then. The Paris Correspondent of our Philadelphia contemporary rates the dangers involved in the practice of the art somewhat seriously. He says in a recent letter:—

"I shall begin to-day by giving a cry of alarm to the profession, and declare that photography is a dangerous trade unless great precautions are taken.

"Photography being a new art, those who begun, if not ignorant of its dangers, were at least indifferent. But at present a cry of alarm must be raised; we have had to mourn the loss of too many who would have rendered great service to our art had they not been cut off in the prime of their lives. Many of the pioneers of photography have passed away too suddenly; the many deaths among the profession, the great number of operators who are suffering from a slow but sure disease brought on by their trade, make it a duty to inquire into the principal reasons for such a state of things, and call upon the profession to beware, and warn them at the same time of the precipice to which they are approaching ere it be too late.

"The business of the photographer presents many dangers, the more to be feared because they are invisible. The air of the dark room is too often contaminated with ether, alcohol, acids, bromine and iodine vapours, not to speak of the noxious vapours from the cyanide of potassium, which, mixing with the different gases and vapours, form dangerous combinations which poison slowly but surely the unhappy being exposed to their influence. The photographer lives in this poisoned atmosphere without its appearing to have any effect upon his health. I say appearing, but which declares itself after many months, sometimes after many years, by a stomach disease, too

happy if a chest disease does not complicate the damage already done.

"As I am a sufferer from want of former precautions, I advise all photographers—

"1st. Never to put any chemicals in the dark room that are not absolutely necessary.

"2nd. Never employ cyanide of potassium.

"3rd. Spare no expense to ventilate the dark room and the laboratory.

"4th. Never undertake to make nitrate of silver and other chemicals without being completely organized, and the laboratory separated from the other parts of the building.

"5th. Never drink spirituous liquors, for too much alcohol has been absorbed during the day's work.

"In following these simple rules, health and happiness will be secured.

The advice is so good generally, that without discussing the imminence of the dangers attending the practice of photography, we have no hesitation in endorsing it.

TONING WITHOUT GOLD.

FROM a communication from Messrs. Johnson and Matthey, which appears on another page, our readers will learn that a considerable reduction has been effected in the salts of palladium, to the use of which for toning purposes we referred in our last. This modification in the cost will probably render palladium salts more available for the purposes of the experimentalist, to whom, for toning purposes, it offers undoubted attractions where a tone of an absolute black, quite neutral, is required. As a toning agent for transparencies palladium possesses many advantages: toning with much delicacy and uniformity, without clogging or filling up the finest lines, or giving excessive density or thickness to the deposit of silver of which the image is formed. The pure black of the tone, and the delicacy of the image treated with salts of palladium, give the transparencies great value for lantern purposes. Some years ago we noticed some tones produced by the various noble metals other than gold, used either alone or in combination with gold, the results of a series of experiments undertaken by Captain Sellon, several of which we repeated with similar results. Many of the tones were very satisfactory indeed, but not superior to those obtained by gold; and we at the time came to the conclusion that no specific improvement was promised, unless economic advantages were involved, which at that time were not presented. The reduced cost to which the letter of Messrs. Johnson and Matthey refers, again brings the subject under consideration, and invites the attention of experimentalists. As a hint for those who may be inclined to try the palladium salts, we may remark that in the experiments of Captain Sellon, and in our own hands, they were treated in manner similar to the chloride or seleniochloride of gold. In toning transparencies and intensifying negatives a neutral solution, containing about six grains of the salt in an ounce of water, was found to answer well. Where a negative required a very slight degree of intensification after it was fixed, palladium possessed the special advantage of strengthening half-tones in due ratio to the dense parts of the picture. No apparent increase of thickness of deposit was noticeable, but the grey image of iron development acquired a black tone, which, being more adiastric, gave the negative greater printing value.

PHOTOGRAPHY IN HOLLAND.

WE subjoin a letter received from an old correspondent of the NEWS residing in Amsterdam, accompanying some excellent stereoscopic prints. Many of his remarks possess considerable general photographic interest. We print his letter as it stands:—

"DEAR SIR,—I have the pleasure to forward you by to-day's post a few photographs (as per list on another page). With the exception of No. 0, they are all from *dry* plates,

chiefly coffee-preservative. The Swiss views were all developed in the evening over a basin in the bedroom, and fixed when returned home. The stereograms are all taken with a binocular camera (Dallmeyer's lenses), and should you consider some of them worth mounting they are to be cut through the centre, and "right" to be placed left. The paper is —, which I consider among the best in the market; only when mounting the photographs they are to be thoroughly wetted, otherwise the paper cracks. As we have only very few amateurs here, and, until lately, no dry-plate workers at all (I, as president to our photographic society, try to stir our members up a little), I have no points of comparison, and am entirely self-taught, chiefly through the *News*, to which, and yourself, the photographic art owes so much. The enclosed photographs have all been fixed and washed as lately advised in the *Photographische Correspondenz*—i.e., they have been washed in three changes of water only, the two first containing *eau de Javelle* (solution of hypochlorite of soda). No. 0, the varnish whereof got spoiled, I made with Black's silver bath (five per cent. nitric acid, and no bromide in the collodion). You see, the exposure was nearly instantaneous, and the picture rather too soft, instead of hard, as might *a priori* have been expected.

"Last year I introduced here the carbon process, by translating the Autotype Manual. I do not think, however, that excepting two or three of the largest articles, it has come into general use. I think myself that there is still great room for improvement in that direction. According to my experience the actinometer is all wrong—i.e., in this sense: that one I had is frequently too much, and gives over-exposed pictures. Talking this matter over with one of our best photographers who practises the carbon process largely, he said: 'I agree with you, and have changed the Autotype actinometer, in this sense, that in lieu of the slit I made a circle, which I divided into four, each part having a different tint, but the darkest not higher in colour than the standard colour of the Autotype Company's actinometer.'

"On some glass transparencies made with 'the transparency paper' I got a liberal sprinkling of black grit (like coal dust), which my friend told me was the fault of the paper, or rather of the gelatine layer thereon. To amateurs these drawbacks are doubly disagreeable, as they render the process exceedingly costly. It seems to me that quite a different sort of negative is wanted; now we try to get them soft, and full of detail. For the carbon I think we require them full of detail, but very strong. I consider the reddish-violet colour of the transparency rather inartistic. Could the Company not imitate the colour of Ferrier's albumen glass transparencies?

"This morning I met in my album a portrait of mine made by the late Wothlytype Company in Regent Street, some twelve years ago, and printed with uranium. It is as fresh as on the first day, and, apart from all commercial considerations, it seems to be a very good process, after all. You will remember that the exact formula for working it was never given—in fact, Wothly told one thing in London and another in Paris. The Company now being defunct, do you believe Col. Stuart Wortley might be induced to give an accurate description of the process?

"This is rather a rambling letter. I hope it may reach you in good health and spirits.—Believe me, dear sir, very truly yours,

A. L. T. HAKMAN.

Amsterdam, January 7th.

RETAINING FULL GLOSS ON CARBON PRINTS.

ONE of the difficulties with the beginner in producing glazed carbon prints after the manner of M. Lambert is the loss of gloss in mounting, where the print has spontaneously left the glass before mounting. The manager of the carbon printing department in one of the largest portraiture establishments in Boston, U.S., sends us the fol-

lowing remedy for this trouble, and at the same time encloses some very fine examples of his work. He says:—

"Having, like others, perhaps, found some difficulty in obtaining at all times chromotypes with full glaze, owing to their leaving the glass before drying evenly, I have used lately, instead of a waxing solution, the following:—To one ounce of alcohol add five drops of nitric acid; rub the glass plate with a little on a piece of cotton-flannel till it feels smooth, and no lines or marks are seen; then with another flannel rub over with powdered talc; it will then feel slippery; run a line of dilute albumen round the edge, dust, and coat with collodion as usual. I find that the plate may be used two or three times with a rub with talc only after the first print has left the glass, but if it looks cloudy it is necessary to use the alcohol and acid again. This has also been used here for obtaining silver glacé.—Yours, "E. H. D."

EDINBURGH PHOTOGRAPHIC EXHIBITION.

(THIRD NOTICE.)

IT is unfortunate that, to make room for the Annual Exhibition of the Royal Scottish Academy, the Photographic Exhibition had to be closed on Wednesday last; but very gratifying, nevertheless, that, so far as we can learn, the whole of the exceptionally heavy expenses have been met, and a substantial balance left over. The council of the Edinburgh Photographic Society made a bold stroke, and their efforts have met with a suitable reward.

In portraiture the exhibition was very rich, but, with few exceptions, all were more or less retouched. It is, however, pleasing to be able to say that, on the whole, the work of the retoucher was well done. Mr. R. Slingsby, of Lincoln, exhibits some high-class work. His portrait of a lady (No. 418) has been a general favourite. Easy and graceful in pose, perfectly simple in composition, it forms a charming picture, which invariably commands attention. Messrs. Schulz and Suck, of Carlsruhe, send some very beautiful examples of portraits finished in crayon; No. 408 is, perhaps, one of the most satisfactory portraits in the galleries. Printed from a fine negative, to begin with, it has been wrought-up by a master hand in such a way as to retain the natural texture of the skin and the most delicate detail in the drapery. Dupont, of Brussels, shows a frame of six large portraits, specimens of most perfect silver printing and satisfactory posing. Numbers 4 and 5 are also examples of beautiful rendering of light gauzy drapery. Mr. A. Ford Smith, of Llandudno, has a number of fine pictures, principally combination effects, most of which we noticed while they were on exhibition in London. Peculiarly attractive in his "Reverie" (No. 569), in which, by a somewhat original pose, a really charming picture is produced. Mr. Marshall Wane, as usual, is well represented, and is well entitled to the award he has obtained; and the same may be said of Mr. J. M. Young, of Llandudno; his "Hide and Seek" (No. 457), for which a silver medal has been given, is one of the most pleasing portraits in the room, a single figure and a curtain being by very simple treatment made into a most charming composition.

Herr Kozmata, of Budapest, is also well represented. Especially noteworthy are two portraits of children (Nos. 407 and 411). The 18 by 15 plate is nearly filled by the pretty child in her night dress, and the couch on which she is so gracefully posed; and while holding in one hand a ball, and her chin resting on the other, she looks to the spectator with childlike confidence and simple wonder. The whole of Herr Kozmata's work, but especially the picture referred to, shows him to be master both in art and photography.

Of *genre* and combination photographs there is a large and good display. Mr. Robinson of Tunbridge Wells, Mr. Bruce of Dunse, Mr. Adam Diston of Leven, Mr. Johnston of Wick, Mr. A. Ford Smith of Llan-

dudno, and several other less known but meritorious workers, make a very creditable display. Pre-eminent in this line is Mr. Nesbitt of Bourne-mouth; his "Finishing Touch" (No. 208), and "Basting" (No. 215), are both excellent. The latter, in consequence of the simplicity of its treatment and perfection of composition, leaves little to be desired.

Mr. Bruce still sticks to the bluish colour that to many is disagreeable, and but for that his really clever pictures would meet with more general attention. Where all are so good it is difficult to particularise, but his "Dinner for me laugh" (No. 816) is, perhaps, the most attractive. The scene is thoroughly rustic, consisting of a kind of log house, an old tree, and a wheel-barrow. Seated on the latter is a happy-looking school-boy—as is indicated by books and slate—trying to play a flute; but the effort is in vain, as he is made to laugh in spite of himself by the actions of some of his school-fellows, who, however, are not in the picture. The subject as seen is in every respect very satisfactory, and equally so for what is suggested.

On another page will be found the report of the judges of apparatus, &c., and next week we hope to be able to give some definite information as to the actual results of the exhibition from a commercial point of view.

APPLICATIONS OF PHOTOGRAPHY TO THE CULTIVATION OF SCIENCE, ARTS, ETC., IN FRANCE, AS EXEMPLIFIED BY THE RECENT PARIS EXHIBITION.

BY M. A. DAVANNE.*

Touching the applications of photography to scientific research, M. Davanne says that the record of every astronomical phenomenon which is sufficiently luminous should find, as François Arago predicted, a powerful aid in photography. Astronomical observations are, however, of so delicate a nature that in applying photography to register them it is necessary, as a matter of course, to have special and very finely constructed apparatus for the purpose.

The greatest attempt that has been made to employ it in this connection was certainly on the occasion when many nations proceeded to observe the transit of Venus in December, 1874. Already, in 1860, MM. Laussedat et Girard had organised and accomplished, in the name of the *École Polytechnique*, an expedition to Africa, on the confines of the desert, to observe the eclipse of the sun on the 18th July, and had demonstrated the possibility of making photography serve the ends of the astronomer. The results of the work undertaken by the commission of the Academy of Sciences to observe the passage of Venus, and the different missions sent by that body to view the phenomenon in different parts of the globe, have proved anew the importance of the process. A numerous series of pictures was obtained, the greater part upon silver plates, and some upon glass. Thanks to the courtesy of the Academy, and especially M. Fizeau, our Exhibition has been in a position to show to the public some of these records, which remain as undeniable witnesses for the future of a phenomenon whose existence has hitherto rested upon difficult personal observations which it is impossible to check or control.

In choosing processes for the recording of scientific phenomena, M. Fizeau took care not to avail himself of substances which might be subject to alteration in shape or form. He refused to have recourse to films having material thickness, or such as might be changed on the application of developing or fixing agents. The rays of light acting upon the thickness of the film would give deformed images, or a wet film, when dry, might shrink, and thus render useless any calculations based upon mea-

surements of the image. M. Fizeau, in undertaking work of this character, stipulated that the pictures should be taken upon silver plates by the old Daguerreotype process, for in this case there was no fear of any defects arising from the thickness or deformity of the image. The work was rendered more simple, too, by reason of M. Fizeau having arranged matters in the case of every party of observers, and provided that the plates should all be fixed on return. Every transit of Venus party was entrusted with four hundred plates, and one may well judge of the care and pains taken by M. Fizeau in the matter by the success of the pictures that were taken by the several parties.

We may remark that M. Fizeau, completing the former work of Daguerre, changed the minutes necessary for the production of a Daguerreotype into seconds, in being the first to study the action of bromide upon Daguerreotype preparations, and to show, now thirty years ago, the photographic properties of bromide of silver.

For the expedition to Japan, M. Janssen constructed the special apparatus which he has termed the *revolver photographique*, and which being endowed with an automatic movement, permits one to record, within a given time, as many as forty-seven successive images. On account of the state of the atmosphere, it was not possible to verify, in the most absolute manner, the value of this little instrument to observe the passage of Venus, and whether the pictures obtained were as perfect as those secured with ordinary apparatus; but the *revolver* of M. Janssen must be considered henceforth as the most suitable instrument for securing successive images of a phenomenon which is itself subject to continual change.

A more favoured observer, one of the same party to Japan, was successful in securing at Kobe an image upon glass by means of wet collodion, and in this way it will be possible to determine the value of such productions from a mathematical point of view.

M. Janssen was also represented at the Exhibition by some large pictures of the sun, made direct, which showed all the spots and details upon the solar surface. These images were produced by means of a photographic lens, specially constructed of large size, which permitted him to secure plates in a very small fraction of a second.

The French Observatory was not represented, but the Observatory at Kew in England forwarded some specimens, which show to what extent photography may be made use of to record meteorological observations.

To record every instant the variations in the weight of the atmosphere, of the surrounding temperature, of the direction and intensity of the wind, the electricity, the terrestrial magnetism, the amount of moisture in the air, the condition of the sky, the intensity of the light and solar heat, &c., constitute an important total of considerable interest, especially when undertaken simultaneously in various localities over the globe. Such observations serve to permit observers to forecast the weather some days in advance, and to despatch important information to sea-ports and harbours, which is of vast service to the mariner.

To follow such observations day and night, every minute, is a task beyond human energy, and some of them are carried out by means of instruments of a very ingenious and delicate nature, in which electricity replaces the observer. But at Kew the simpler and more preferable plan is adopted of making a lamp write down upon a photographic surface all the movements of the barometer, thermometer, magnetometer, electrometer, &c. A series of curves, representing the variations of the different instruments, is traced upon iodised paper. The instrument work automatically for forty-eight hours, and the task the observer is in this way reduced to the operation of changing the sensitive paper every two days, and developing the traces written upon it.

(To be continued.)

AWARDS FOR INVENTIONS AT THE EDINBURGH EXHIBITION.

REPORT OF THE JUDGES ON APPARATUS.

SPECIAL judges were appointed by the Exhibition committee, to award at their discretion three silver and bronze medals for improved apparatus, materials, processes, &c. The following is their report:—

Your judges having carefully examined the various exhibits in these classes, are unanimous in granting the following awards:—

1. A Silver Medal to Professor Charles Piazzi Smyth for 1031, the plano-concave corrector. This is a new optical arrangement which, being placed in close proximity to the prepared plate, completely prevents the effect of the spherical aberration of the portrait or other lens, and allows full aperture to be used. In the example exhibited this is adapted to a brass camera, which has several extremely ingenious arrangements for obtaining copies of objects in rapid motion.

2. A Silver Medal to Mr. H. Fox Talbot for 1135, three specimens of photo-glyphic engraving. These prints, although produced from negatives which are by no means perfect, are examples of the earliest process of photo-engraving on metal plates, and exhibit in parts a perfection which is not surpassed by the most beautiful of the many fine examples of modern work of the same class. This invention dates from 1853, when the process was first published.

3. A Bronze Medal to Mr. L. Warnerke for 1134, being his ingenious adaptation of sensitized collodion tissue for the production of transparencies, negatives, &c. Although not the invention of the exhibitor, still the adaptations have been carried out so skilfully and completely, and the entire arrangements made so simple, that he may be said to have made into a workable process that which was not so before.

4. A Bronze Medal to Mr. P. Meagher for 1138, an improved folding camera for single pictures 9 by 7 and under. This camera, without being too complicated in design, contains many improvements and adaptations, some of which are new and highly ingenious, and the workmanship is excellent.

5. A Bronze Medal to Mr. Wm. Birrell, of Hamilton, for his automatic oxyhydrogen apparatus. Repeated trials of the apparatus show that it gives a steady, constant light, and is capable of great extension in power.

6. Your judges, while confining themselves to these five awards, may remark that several of the exhibits merit favourable mention, among which are those of Messrs. Geo. Mason and Co., Kemp and Co., Mawson and Swan, George Hare, &c.; and had they not been precluded by the stringent rule laid down that objects, materials, and processes in competition must be exhibited by the inventor or maker thereof, they would have had pleasure in considering many of them, and also Willis' ingenious platinotype process, specimens of which are exhibited, but not by the inventor.

In cameras for changing dry plates in the field they would have made an award, but that of Jonte, of Paris, is not exhibited by himself; and that of Aird, in addition to being in the same category, could not be adjudicated upon in consequence of Mr. Aird being one of the judges.

J. G. TUNNY,
W. H. DAVIES,
JOHN NICOL, PH.D.,
DAVID AIRD.

IMPROVEMENT IN THE PRODUCTION OF LICHTDRUCK PRINTING PLATES.

BY J. HUSNIK.*

THE recent suggestion to employ mixtures of soluble silica with albumen should afford considerable advantages to the Lichtdruck process, and simplify it considerably

* *Photographische Correspondenz.*

The plates made with this admixture of silica last a very long time, and are, indeed, almost indestructible. Moreover, their preparation may be conducted at any time—by daylight or candlelight—and a large provision of them may be made at one time without any fear being entertained in respect to their deterioration. I have had to modify my former formula in one respect only, and that is in regard to the quantity of water added; for I now employ less water. In this way the mixture is produced of a less fluid character, and the plates at the upper end, when previously they began to dry, now appear sufficiently prepared, which was not formerly the case, as the gelatine at this margin, for an inch or an inch and a half, did not adhere sufficiently well.

To prepare the plates, I take—

White of egg	...	...	7 parts
Water glass or soluble silica	...	5	"
Distilled water	...	5	"

If dried albumen is employed, then only one part, and not seven, is taken, and the amount of water is raised to six parts. If, however, my earlier preparation is preferred, then I would recommend that the plates should be coated twice and permitted to drain at opposite corners; but all this I hold now to be superfluous. The further treatment of the plates is the same as I have before described.

In respect to the manner of pouring on the gelatine, I have, however, made some material alterations. It is impossible sometimes to avoid little cavities during the drying of the gelatine plate. These spots always appear on the print as black spots, and the purity of little pictures especially is thereby spoilt. These defects are due to the bursting of very small and almost invisible bubbles during drying. The parts cannot close up any more, while the gelatine, from drying, has become too thick to blend together, and the consequence is that there remains a minute puncture, which takes ink when the roller comes over it. I have noticed that this defect occurs with all operators. It may be avoided, it is true, when boiling water is employed for rendering the gelatine fluid, and when, moreover, the solution is maintained for a long time in a hot state. All the air-bubbles come to the top (and the incipient skin contracts), so that the spreading of the fluid gelatine upon the plate has to be done very carefully. A large quantity of solution is poured on the plate, and allowed to spread out slowly (paper strips being used to aid it), and then the solution is poured off, and some fresh applied, of which only as much is made use of as remains behind when the plate has been quickly reversed. Manipulating in this manner secures clean results, but it is only after considerable practice in the work that even films are secured, and that one gets to know how much solution is required for plates of a certain size.

A much more certain method consists in adding a good deal of spirits of wine to the gelatine solution, and permitting the plate to remain in a slanting position at an angle of about 10° in the drying box. Only, in this case, it is necessary after drying the plate to pour over it the same solution a second time, and, upon letting the surface dry again, to reverse the position which it previously occupied. The drying should be conducted at a temperature of 45° C., and the plate must be brought to this temperature previously to the gelatine solution being applied. The manipulation of the plate must be conducted as rapidly as possible; the drying box must be quickly opened and the plate taken out; the gelatine solution must be applied without delay, the superfluous liquid poured off, and the plate put back again into the drying box before it has had time to cool. Under these circumstances the film is dry in half an hour. The same precautions as regards rapidity must be taken in the case of pouring over the gelatine a second time. In this way, it is true, only two plates can be dried at one time, because the opening of the box too

frequently would otherwise lower the temperature; but, in any case, it must be remembered that in an hour two plates are prepared, and, therefore, in a few hours a goodly number of them may be prepared.

In the double coating of the plates with gelatine solution another important obstacle is got over, which, however, is inherent to the drying box and to the nature of the plates. As is generally known, the plate must be placed in a horizontal position with great care, by means of screws, which fit into iron lars. This is, however, not so easy to do as it appears to be. In the first place, no plate of glass is perfectly level or flat, and this defect is especially noticeable in large plates; secondly, not a particle of dust must be allowed to get under the spirit-level if the trial is to be a trustworthy one; and, thirdly, the iron bars themselves are apt to expand as the temperature increases, so that the plates resting thereon alter their position, and although the films may have been put in the box in the first place perfectly level, the temperature alone suffices to rob them of their horizontal position. Finally, the wood of the box will often shrink or warp (one can hear it crack audibly sometimes during the process of drying), and this again alters the horizontal position of the plate. And if the plate has not remained quite horizontal during drying, the gelatine is found to be of a thicker nature at one side than the other; the result is that the picture, when struck off is darker on that side where there is least gelatine, and lighter where there is most of it to be found. Large plates I have never found to be perfectly uniform, and in those of average size one is able to see some sort of difference, so that only the middle of the plate is sometimes to be used for printing small pictures. By having recourse to a double coating of the plate, the matter is far more favourable to success, and I believe that the disciples of *Lichtdruck* will be well served when this improvement gets widely known.

Gelatine solution containing much spirits of wine flows over the plate like collodion, and does not contain any bubbles; moreover, on the superfluous liquid being drained off, it leaves a mirror-like surface, which it is altogether impossible to produce without the employment of alcohol.

The solution, I may mention, is prepared in the following manner:—Six parts of fine gelatine are put into forty-eight parts of cold water (it need not be distilled water) to swell, and then warmed in a water bath, and finally brought to a boiling temperature; at this point one part of bichromate of ammonia is added, and then forty-eight parts of ordinary methylated spirits of wine are added. The mixture is now stirred so that all the bubbles rise to the top, and the solution is filtered through filter paper or a rag. The solution is made use of while in a warm condition. It is well to keep the solution, if it is to be used further, in a warm condition, and enclosed in a stoppered bottle to prevent evaporation of the spirit, the bottle being put away in the drying-box to maintain it at a sufficiently high temperature for use.

The pictures from these plates have a very fine grain, like ordinary photographs, and are particularly clean. A good printing-plate must appear grained all over excepting in the very high lights. The grain permits the water, on moistening the gelatine, to penetrate, and in this way the printing proceeds in a most uniform manner. Plates that appear to have too little grain in the shadows produce prints that are caked in the dark parts, and do not absorb water. They yield, usually enough, on the third or fourth application of the roller, images of a flat and bald character. In this case they must be washed with turpentine in order that more water may be allowed to permeate into the shadows of the plate.

Such plates as these are not, however, useless. The beautiful grain is more easy to secure the higher the temperature of the drying box, and the more chrome salt is used, and the more roomy the drying apparatus. One must not, however, exceed certain limits in the matter. If

too much chrome salt is employed, it is apt to crystallise out; and if, again, the temperature employed in drying is too high, the salt will decompose the other substances at hand.

As regards the colouring matter to be employed in printing in admixture to lamp-black, I may mention that madder appears to be the only pigment that can be thoroughly recommended for such purpose. All other descriptions of carmin and lacs are to be regarded with suspicion, and should be made use of only under exceptional circumstances. Madder, unfortunately, is a costly pigment; and not only that—it is often obtained in commerce adulterated or spurious, and for this reason I have for some time past cast about for another colouring matter as permanent and cheaper. This I have found in dark iron-violet. There is also a light iron-violet to be purchased, which has, however, too little body and power, and for this reason I always prefer to employ the former. It is very rich and economical when rubbed down with lamp-black, and imparts to the pictures a magnificent purple-violet tone. Moreover, it does not colour the gelatine on the plate, as is the case with carmine and various gums; and it is unaffected by light and external influences.

PROPOSALS FOR UTILISING THE WASTE PRODUCTS IN CARBON PRINTING.

BY DR. J. SCHNAUSE.*

Those who occupy themselves continually with the carbon and *Lichtdruck* processes must frequently regret that they have to pour away such large quantities of useful materials with their washings. Some experiments which I have made for the purpose of ascertaining how far these waste products may be utilised again, are not as yet complete, but they have taught me, at any rate, the lesson that where one has to do with large quantities of the material it is a paying matter to collect such residues, any outlay being fully recouped by the results. Time and trouble, too, are so insignificant in the matter as hardly to enter into consideration.

As an instance, I may mention the saving of the chromic acid from the washing of *Lichtdruck* plates. In the preparation of these I employ, almost exclusively, bichromate of ammonia, and as this is much more expensive than the bichromate of potash (the former costs 14-00 marks per kilo., or seven shillings a-pound, and the latter 1-30 to 2-60 marks per kilo., or eightpence to sixteenpence a-pound), I tried to get back the ammonia salt from the washings, after precipitation of the gelatine present by the aid of tannin, by evaporating the liquid, having previously taken care to employ but a little clean water in the first washing. A portion (if very little) of the bichromate I knew would be robbed of its chromic acid by exposure to light, but yet, by this mode of proceeding, I obtained a mass which was very impure indeed, by reason of the amount of organic matter mixed with it. A more profitable plan is, therefore, to take the first washing, which can always be treated with a little acetic acid to decompose the bicarbonate of lime, and to precipitate the chromic acid as chromate of lead by the addition of a sufficient quantity of sugar of lead solution.

In the case of a concentrated chromate solution, the chromate of lead is precipitated of a more beautiful and intense colour (especially if spring water is used to which acetic acid has been added, to prevent the formation of the white carbonate of lead) than when a dilute chromate solution is operated upon. The price of acetate of lead is one mark per kilo., or sixpence a-pound, while that of chromate of lead is five times as high.

If the development water from pigment or carbon printing is collected in a large vessel, the colouring matter (chromate of lead) gradually sinks to the bottom. *—after*

* *Photographisches Archiv.*

fine state of division, which is certainly useful for many purposes.

Perhaps these few lines may induce some of my colleagues to consider the matter, and to undertake some experiments towards promoting economy in this branch of photography.

JOTTINGS FROM MY NOTE-BOOK.

BY T. FODRAKE.

Babies' Portraits.—Never pose a baby, or even a child three years old, until the plate is ready, the size of the figure decided on, and the focus as near as possible obtained. Then watch your opportunity; as soon as the plate is in the camera, the child will watch your movements, and as soon as the expression is right, slip off the cover, give it two or three rapid turns with your hand to arrest the attention of the child, and the thing is done. The leather cover is far better for this work than the instantaneous shutter. But for babies a month, six weeks, or two months old the thing is different; they really take no notice, but mothers will have them photographed, and that, too, with their eyes open. Turn their faces from the light, get a third party in the room to move rapidly a newspaper about four feet from the direction they are turned, and you arrest the attention long enough to catch the likeness. Never try more than two or three times, if you fail, either with children or babies; you only exhaust your patience and chemicals to no purpose; let them come again. Never try babies without a quick lens and good light; if you do, you will fail, and your customers will give you no credit for trying, but only remember your failure. Adopt the above hints, and you will rarely fail in getting satisfactory results, and putting money in your pocket; for if you photograph the children right, you will get the adults.

A Warning.—A photographer may accidentally produce "fulminate of silver," and by that means engender serious consequences to himself and others. If a nitrate of silver bath be warmed, and alcohol be added, a white precipitate is deposited, which is the compound referred to, and is highly explosive. If a photographer should evaporate a silver bath that has long been in use, and is both acid and contains a large amount of alcohol, he must be very careful to avoid an explosion.

Test Papers.—Test papers should be carefully protected from the atmosphere, otherwise they assume a purple hue through the action of carbonic acid, which is present in infinitesimal quantities in the air. If they are then immersed in a half pint of water containing about two drops of liquor potassa, they are restored to their former colour.

Correspondence.

AMATEUR VARNISH MAKING.

DEAR SIR,—In the *News* of the 19th inst., in reply to correspondents, to "R. D. F." you say: "We do not counsel amateur varnish making, because the selection of resins and solvents, and their proper mixture, require much experience, and failure is often a serious matter." Will you allow me to suggest that if your correspondent wishes to prepare his own varnish he can do so cheaply and well, and without any difficulty or risk of failure. Let him buy at any oil shop one pint of white hard spirit varnish, and dilute it with one pint of methylated spirit, and filter, and he will have a capital varnish which is very hard. One drop of castor oil to each ounce of the varnish gives it a good bite for the pencil. For the above I am indebted to Mr. Sydney Smyth in the *Year-Book* for 1875. I have used it in my business ever since, and find it answer well. Thinking it may be useful to your correspondents, I have reproduced it.—Yours truly, T. S. SWARTZMAN.

CHLORIDE OF PALLADIUM FOR TONING PURPOSES.

DEAR SIR,—Referring to a notice upon the use of the salts of palladium for toning in lieu of gold, which appeared in your last issue, it may interest your readers to know that the principal photographic chemical dealers are now supplying the soluble chloride of palladium at a lower price than the salts of gold, which it will doubtless supersede to a great extent.

The salts of rhodium and iridium, though more costly, also give most interesting results, and have, like those of palladium, been employed for some time past, to a limited extent, for first class work.—We are, dear sir, yours faithfully,

JOHNSON, MATTHEY, AND CO.

Hatton Garden, London, January 22nd.

CARBON TRANSPARENCIES.

DEAR SIR,—I perceive in your last edition of the *News* a communication from Mr. J. R. Sawyer, to Dr. Vogel, of the method employed by the Autotype Company in the production of carbon transparencies, in which he recommends coating the tissue with collodion, previous to attaching it to final support, as described by me on page 261 of last volume. I have sometimes used an ordinary albumenized plate as permanent support, after coagulating with hot water, then coating the exposed tissue with very thin normal collodion, bringing in contact under water, and pressing firmly together with squeegee, with excellent results. But the most simple of all methods for producing carbon transparencies for enlarging is as communicated by me to this year's *PHOTO. NEWS ALMANACK*. I have enclosed a few specimens for you, Mr. Editor, to express your opinion upon.—I remain yours truly, FRANK DORE.

[The examples enclosed are excellent.—Ed.]

"PICKING UP" THE CARBON PROCESS.

SIR,—I beg you will give me leave to endorse the remarks in your last issue, under the above heading, as to the unseemly tone of "A Successful Worker," whose condemnation of acquiring information, or picking up hints, through the journals, if carried out consistently, would render your journal, sir, quite needless, except as an advertising medium.

Take my own case as an instance, and I doubt not hundreds are similarly placed. I keep no operator, preferring to meet personally my customers. My time, when not occupied with sitters, or copying, is devoted to the books, or superintending the reception room, and looking after my three men, viz., artist, mounter, and printer. The latter prints well in silver, but quite fails in carbon. Now I cannot afford to devote my whole time for even three or four weeks to this, in order to teach him. A gentleman did call round and demonstrated before him (for a fee), but it was pretty well a failure, owing, he said, to his tissue, brought with him, being too old. I therefore ask, in common with "A Carbon Experimentalist," for the most convenient appliances money will buy, in order to facilitate as much as possible the working of the process. Can we get a proper boiler, with Bunsen burner, rose, dishes, &c.; in fact, all the apparatus required in working the process commercially?

I am afraid of your scissors, or the waste basket, or I would have written further on the subject. At present I sign myself, sir, your obedient servant,

ANOTHER ANXIOUS TO LEARN.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday next, February 1st, in the Rooms of the Society of Arts, Adelphi, Mr. William Brooks will read a paper on "The Emulsion Process applied to Transparencies, and Enlarging, &c., without a Nitrate Bath."

TRANSPARENCIES ON GLASS.—We have been favoured by Mr. Wm. Brooks with some transparencies on glass, in which the tone is exceedingly rich and fine, produced by development without any subsequent toning. The colour by transmitted light is a deep warm brown or smoke colour. They are printed on plates prepared with bromide emulsion, and developed with alkaline solutions, the best tones being produced by Mr. Brooks' modifications of the alkaline developer. Mr. Brooks will read a paper on the subject at the next meeting of the South London Society, and enter into full details. He observes that the production of stereo transparencies on glass seems to have died out, probably because the cost of production renders them too expensive for the market; but as the method he employs will materially cheapen production, he hopes it may aid in reviving this branch of the art, especially as thousands of stereo negatives are now lying idle which might be productively employed. The subject well deserves attention.

PRINTERS' ART UNION.—We notice that the show cards announcing the sixth annual drawing for prizes in connection with the above give photographs, executed by the London Stereoscopic Company, of two oil paintings forming the second prize, the subjects being "The Willing Slaves," by P. Jackson, and "Fou-y-gross" (or the Head of the Cross), by Eleanor Brown, S.F.A.

M. ED. BACQUEVELL.—*Nature* notes that this gentleman, to whose researches photography is so much indebted, has been elected president of the French Physical Society, which seems, like its English sister society, to be doing excellent work.

CENTENNIAL ITEMS.—Mr. J. T. Dexter, the representative of the *Paper and Printing Trades Journal* at the Centennial Exhibition, writing under the above heading, says:—"Of chromos and photographs there is virtually no end. Photography, in the skilled hands of R. Newell and Son, is the father of the best of many artistic memorials; producing pictures of large dimensions of the unoccupied site, the buildings during erection, and the grand aggregate of structures in which the Exhibition was embraced. With such views as these before one, the eye taken in the whole area—extensive as many a London parish—and all that it contains, presented with unerring fidelity, and so as to give clearer notions than it is possible to obtain from any number of separate illustrations. When it is said that the work is worthy of the occasion, the fittest tribute is rendered to Messrs. Newell's skill, identified already as that was with the 'Old Landmarks and Relics of Philadelphia.'"

"THE AUBELTYPE PROCESS," says *The Paper and Printing Trades Journal* ("invented by Aubel, of Cologne), by which can be obtained good typographic reproductions of engravings, consists in preparing a photographic negative on glass with a salt of silver, and depositing more silver in the battery. The silvered plate is subjected to the fumes of hydrofluoric acid, which eats away the parts unprotected by metal, and so prepares the matrix of the plate."

To Correspondents.

SILVER THREAD.—The formula (as you will see) is quoted from an American contemporary. The cotton seed would, doubtless, be one of the samples made and sold in America, where, as American photographers in many cases make their own collodion, good commercial samples are in the market. In this country, good pyroxyline is not so easily obtainable. To use the formula you must make or buy the best sample you can, and use it in such proportion as will give a collodion of a satisfactory consistency. Of a good sample of cotton four or five grains to each ounce of solvents will generally give a collodion of a satisfactory consistency for ordinary work. In our own experiments in the manufacture of collodion we have generally found it desirable to make our own soluble cotton, using the formula we have published in the *News* and in several of our *Year-Books*.

H. W.—No iron developer should stain the negative if properly used. Stains on a negative are more often the result of imperfect manipulation than of any fault in the developer. If the solution does not flow evenly, stains will, of course, be produced, but this may be remedied by skill and care in applying the solution, or sometimes the addition of alcohol may be necessary. The addition of a little sugar is also a remedy at times.

ENQUIRER.—We cannot tell you with certainty the cause of the spots without knowing more of the processes through which the print has passed. They suggest that the print has been toned in a turbid solution. If chloride of lime, for instance, were employed in the toning bath, and portions of this had settled on the face of the print, such a result would be produced.

JOHN ENNIS.—If the name be written upon the negative with any non-actinic pigment (reversing the letters, of course, that they may appear in proper order when printed), they will, of course, appear all right in white letters on the print. Indian red, or cadmium yellow, answers well for the purpose; after mixing a portion to the proper consistency on a palette, a fine sable pencil may be used in writing. A good carte lens may be used for enlarging purposes, and is more convenient than a larger lens of long focus. The *Year-Book* for 1875 may be obtained at our office.

AGENCY NOTES.—Success in photography as a profession depends chiefly upon photographic skill and business ability. How far you would be likely to succeed we cannot, of course, offer any opinion, beyond remarking that the amount of capital you possess, although small, might, with the requisites we have named, be sufficient. The training you name in a chemist's shop generally induces habits of neatness and precision which are valuable in photography. The scale of advertising charges of the *Photographic News* generally appears in some part of the advertising pages, and may always be obtained of our publishers. You will find details in the present issue.

R. T. W.—The process of producing prints in Prussian blue is one of the oldest of photographic processes, and all details regarding it have been repeatedly published. In the work on photography published by Mr. Robert Hunt in 1851 the history of the process and all details are given. In our last issue, on p. 34, you will find details. In the second solution there named the water should be 2 ounces, and the ammonia citrate of iron 140 grains. The process is not difficult, and the materials are not so expensive as in silver printing.

H. WARREN.—We have published many methods of printing photographs upon wood. Much depends upon the purpose intended as to which is the most suitable process. The permanent ink photograph which appears in our *Year-Book* is produced by a photo-collodionic process, in which the print is obtained in a printer's ink in a printing press, worked on the same principle as lithography. We have published full details of several such processes in the *News* and in our *Year-Books*. You will find information on the subject in the *Year-Book* just issued, and in the issues for the last few years. We regret that we cannot answer questions on photographic subjects by letter.

LANDSCAPE PHOTOGRAPHER.—You may still register your views, and may then proceed against any one who copies them after registration. But a difficulty here arises: you will find it difficult to prove that the copy was not made from one of the early prints issued before registration. It is not necessary to register different sizes of the same picture. We make it a point to publish all the information available upon the photo-collodionic processes. The chief thing necessary for success in their practice is experience, which can only be obtained by personal effort.

CANVAS.—There are various processes for printing on painter's canvas, which we have published. One of the best modes of obtaining photographs on canvas consists in transferring a collodion transparency or a carbon print to the canvas; or the surface may be treated with a chloride, and sensitized with silver. In this case the surface of the canvas should first be well cleaned with alcohol, and the chloride applied in a weak solution of gelatine. The solutions may be applied with a brush, or the edges of the canvas may be turned up to form a dish, and the solutions flowed over the surface. The latter is the best mode of applying the developing solution, which should consist of a 4-grain solution of gallic acid.

E. D. BIRD asks how to "get photographic spots out of photographic prints after they are fixed." We do not quite understand what he means by "photographic spots." If he means silver stains, a little solution of cyanide of potassium, applied with a camel's hair pencil, will probably serve.

H. W. D.—We do not remember the address of M. Jones, nor has he, so far as we know, any agent in England. Herr Warnke, who took some interest in explaining the working of the camera, can probably give you the information. His address is 10, Linden Grove, Peckham Rye.

B. RICHMOND.—Thanks. As a rule, however, communications in verse are not suitable for our columns.

PRODUCING BLUE PRINTS.—In the article on p. 34 of our last number on this subject there is an error. In the "second solution" the proportions of water and ammonia-citrate of iron require transposition, making water two ounces, and ammonia-citrate one hundred and forty grains.

W. KURTZ.—Thanks in advance; prints have not, however, arrived yet.

H. TAYLOR.—Thanks.
Several Correspondents in our next.

The Photographic News, February 2, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

HONOURS TO SCIENTIFIC PHOTOGRAPHERS IN FRANCE—NON-SUCCESS OF THE TRANSIT OF VENUS PHOTOGRAPHS—A SPECIAL CORRESPONDENT IN SCIENTIFIC CIRCLES.

Honours to Scientific Photographers in France.—The scientific men of France are doing honour to their photographic investigators just now. The *Academie des Sciences* has elected M. Peligot, the president of the French Photographic Society, to be president of the *Academie*, and M. Fizeau, whose name is well known as an early worker at Daguerreotype, has been nominated vice-president. M. Peligot succeeded M. Balard in the *fauteuil* at the French Photographic Society, and has presided over its meetings and deliberations since the death of the discoverer of bromine. M. Fizeau's name is known to most photographers as one who worked earnestly to convert the Daguerreotype image into a printing block. He was one of the first to perceive that in order to perfect a process of light-printing, something should be done towards producing a cliché or block from which further examples could be produced. Daguerreotype, though presenting a most beautiful and delicate result, could not be multiplied in any way. For every image that is desired a fresh exposure is necessary, and this inconvenience M. Fizeau set himself to overcome. It was his object to convert the Daguerreotype image into a block from which impressions could be pulled in ink. Before, however, the French investigator had gone very far, Fox Talbot had convinced experimentalists that his method of producing images upon a transparent medium was, after all, the most promising; and so it proved, for the English photographer soon distanced every other competitor in the field. For Talbot's paper photographs, which could be printed through, and thus made to serve for the production of copies equal to the original, were at once so simple of preparation, and so perfect in their nature, that M. Fizeau saw there was little to be gained just then by pursuing his investigations, and therefore abandoned them. Lastly, however, since mechanical printing has made such rapid strides, M. Fizeau's process has again been talked of, and we doubt not that further experiments will be made in the matter to ascertain whether or not some practical phototype or photo-engraving process cannot be elaborated to vie with those brought forward now-a-days. M. Fizeau did a great deal towards developing a mechanical process from the Daguerreotype plate, and if but a practical plan could be elaborated, it would offer many advantages. The silver plate that receives the image being of a solid unyielding nature, the image is invariably sharper and more true than that secured upon a spongy collodion film, and hence, for scientific purposes especially, the Daguerreotype process will always retain a place among photographic processes.

Non-success of the Transit of Venus Photographs.—While on the subject of scientific photographs, we may mention that rumours come from Paris of the unsatisfactory character of some of the photographs taken during the Transit of Venus. These pictures, as most of our readers know, were secured in order that measurements might be taken from them, and for this reason, seeing the minute nature of the images, it is absolutely necessary that they should be free from all suspicion of distortion. Unfortunately, this does not appear to be the case, and we are told that out of a thousand plates which have been examined under the microscope in order that they may be measured; only forty-seven have given satisfaction. Unforeseen difficulties are said to have arisen, and altogether the affair is not progressing favourably. Such intelligence as this is most deeply to be regretted after the expense and labour involved in securing the images. The French savans, it may be remembered, extended their journeys to Japan to secure their results, and

besides the many thousands of pounds expended by the French Government in fitting out and transporting the expeditions, there are the devotion and labours of the gentlemen who took part in the investigations to be considered. In respect to the work of our countrymen, but very little has transpired, outside the walls of the Royal Observatory, beyond the first news that the measurements were progressing favourably. We trust we shall not be deemed impatient if we express a hope that some intelligence may soon reach us of the results which the Transit of Venus observations have yielded, for it is now just two years that the records were secured. It was said that Russia, by reason of the skill and practice of its mathematicians, would be the first to present us with the results of the international observations; but as yet not a sign has been made by any of the savans engaged in the calculations.

A Special Correspondent in Scientific Circles.—It is seldom that the general public take much interest in scientific proceedings, at any rate to such an extent as to employ special reporters, as they did, for instance, in the case of the Transit of Venus just alluded to. The reason of this is, doubtless, the fact that scientific phenomena are rarely put forward in a manner to be popularly appreciated. One great point in the success of Faraday as a lecturer was, doubtless, the circumstance that he had a happy manner of expressing a dry scientific fact in interesting and homely language. As a rule, however, science is presented in too abstruse a form to be generally appreciated; and a phenomenon must be a popular one indeed to secure a good place in the newspapers. Nevertheless, opportunities do occur when special reports on scientific matters are eagerly looked forward to, and when early news is so desirable as to call for the services of that energetic being—the special correspondent. With such men as these, nothing seems impossible; and as instances of their invasions into the domain of science are rare, we may be permitted to cite a case which came under Mr. James Glaisher's notice some years ago. As everybody knows, the Royal Observatory at Greenwich is sacred ground; visitors, it is true, are permitted at certain times, and under certain restrictions, to view some of the rooms and laboratories about the place; but, for the most part, the establishment is kept hermetically sealed, so far as the public are concerned, whose profane footsteps are not allowed to tread the hallowed chambers. A solemn silence reigns throughout this temple of science, only broken by the tick of clockwork and the regular beat of pendulums. The assistants quietly record their observations and make their calculations; such work needing little interchange of words or conversation. On the occasion of which we speak, the staff happened to be unusually busy, for an unprecedented shower of meteors had been predicted, and to record the number of these was the arduous task of all concerned. The shower had been spoken of in the newspapers in every part of the globe, and thus a public, as well as scientific, interest attached to the phenomenon. At midnight the fiery shower began, and the heavens were for hours studiously watched by expert sentinels. It was a clear, still night, every star shining forth from the skies, and silently and rapidly the Astronomer-Royal and his assistants pursued their work. The small hours of the morning still found them at their labours, and four o'clock struck before the last of the stars had fallen from heaven. "That makes 7521 up to four o'clock precisely," said one of the assistants, half aloud. "I beg your pardon: how many did you say?" returned a voice unexpectedly from behind him. The assistant turned and found a stranger, and a total stranger. How the latter came to be there no one knew; so suddenly had he appeared that he might have fallen from the skies, only he did not look like a star. "7521," repeated the assistant, all amazement; "but who are you—where did you come from?" The stranger carefully noted the information, and then said, very quietly, "Thank you, thank you very much indeed! I am a special correspondent on the *New York Herald*." How the stranger got there, how he had

to act upon the image for some time, I let the liquid run off, and when necessary pour over fresh cyanide solution, and finally rinse thoroughly with water. Should the image after this treatment remain still too opaque and dense, the experiment must be undertaken a second time, only care must be taken to allow the film to dry before processing.

The action of the solution upon a dried film in this way seems to be more energetic than where the silver image is free of all impregnation with water.

As the film may receive a tendency to leave the glass plate, especially if the pressure is repeated more than once, it is well, before beginning the experiment, to coat the margin of the plate with varnish, so that the liquid may not loosen the edges. I may call attention to the circumstance that the tone of a plate treated in this way is altered in a very palpable manner; it assumes a yellowish tinge, which, as every practical man knows, yields far better prints than plates possessing a bluish tone.

TRICKS AND TRUTHS.*

[A CONVERSATION BETWEEN DOCTOR AND ARTIST.]

SCENE.—Operating Room at Hastings, White and Fisher's Gallery.

Artist. Now, Doctor, how would you like to appear in this photograph?

Doctor. Well, make it as you think a doctor should look in a picture.

Artist. But there are a variety of expressions: shall it be the one you would assume on being called up at midnight, or that at the recovery of your patient?

Doctor. I should prefer that smile of satisfaction one would be likely to exhibit on receiving the amount of a bill he had considered lost.

Artist. You have some experience in that line, doubtless. Now, I like doctors. If I were not an artist, I would rather be a doctor than a governor!

Doctor. I think the profession of doctor is the most useful of the two.

Artist. Of the three, you mean. Now, see here, a doctor is more useful than a governor, and an artist is more useful than a doctor!

Doctor. I should like to know how you make that out. Don't you think that will be difficult to prove?

Artist. Difficult? Oh, no; governors would die without doctors, and doctors only make men fit for the artist; and then you know the works of doctors die in the bodies of men, and by artists' works the bodies of men live for ever. Now sit down, please.

Doctor. Quite an argument, indeed. You have been very successful in business here, I am told.

Artist. Quite so; our business has assumed greater proportions than we anticipated in the outset. We started without a specimen, and it was uphill work for awhile. Ah, Doctor! specimens are in demand even in the medical profession.

Doctor. Good ones, you mean, of course? But is not the reputation of your photographs due somewhat to the fact that they so often flatter the originals?

Artist. Very likely; of course we take out the wrinkles, if there are any, as the camera makes them appear harder than in the original. Then we straighten the nose, if it needs it, and smooth away the harsh lines. Once in awhile we run across a party who orders them to be left in, but this is seldom the case.

Doctor. Are your customers, as a general thing, exacting and hard to please?

Artist. Some of them are. Look this way, please. As a matter of course, they all want to be made good-looking. For instance, about a year ago a lady desired a photograph

of herself to look as near like Mrs. Scott Siddons as possible. She was very fleshy, and just the opposite of what she wanted the camera to make her in the picture. Here was a case where we must be untrue to nature, or lose the trade. We made the picture. It was unlike Siddons in everything but position. We then sliced the arms down to proper size, took the superfluous flesh off the face, tapered down the waist, and rounded off the form to order, and the lady was perfectly charmed with the result. Now turn the head so.

Doctor. But this must have been an isolated case.

Artist. Not at all. We can accomplish a great deal by means of photography, and the resources of our art are still unfathomed. Not long since, a young man died suddenly, who had never had a sitting for a picture of any kind. His family were very anxious to get some kind of a portrait. We went to the house, and succeeded in getting a good negative of the features and general expression of the dead man (the friends said the corpse looked very natural); of course the eyes were wanting. We eliminated everything deathly in the negative, put in the eyes, and finished it in crayon, and when the family looked upon the finished portrait, they pronounced it perfect in every particular. Are you tired, Doctor?

Doctor. Oh! no. I was going to ask if men are as hard to please as women?

Artist. Yes, and sometimes more so. Some of the men who engage sittings are quite fussy about the shape, position, and general appearance, and often desire a second or third sitting, because some piece of wardrobe was not properly adjusted to their taste.

Doctor. How do you manage to get along with such people?

Artist. That is quite a trade in itself. We agree to give them sittings until they are suited; but some of them never are; but as we require a deposit when the negative is made, it has a tendency to shut off those who sit just to see how they look. There now, all ready; wink as much as you please. [Plate exposed.]

Doctor. I was thinking during the exposure why it happens that while the photograph is true to nature in regard to form, that the white seems too light and the dark too dark. How do you explain this?

Artist. While I am developing this plate I will place in your hands Dr. Vogel's opinion on that subject, as he is the highest known authority.

[Artist disappears and Doctor reads.]

"Critically speaking, the photograph does not represent the exact order of light and shade one finds in nature. Light objects require a short exposure, dark ones longer, and as both must be taken together, it is not always easy for the operator to get a good picture. He must select a tasteful position, and secure a good expression of the face; but this expression is ever varying from a thousand circumstances, so that the photographer is not necessarily to blame."

[Artist returns.]

Doctor. I should judge from this that harmony should exist between complexion and costume in order to secure the most favourable results.

Artist. That's just it, Doctor. True, we can control the light much better than we did a few years ago; but where the face is very white the dress should not be very dark. We have such cases very often, and, of course, as the one or the other must be sacrificed to a certain extent, it is usually the dress, as the face is considered the feature in a picture. If people would study this in regard to sittings, they would secure more pleasing pictures.

Doctor. And the business of furnishing people with copies of their loveliness, you say, is increasing?

Artist. Increasing every year. There is absolutely no limit to progress in the art, so that a year hence everybody may want a new picture.

Doctor. You say the proofs will be ready to-morrow. Well, I will send a boy in for them.

Artist. Excuse me, Doctor, but a proof is an unfinished picture, and fades quickly; and although many of our patrons have taken the proofs to show their friends, yet we have always felt that it was not just to them or to ourselves, for in many instances we have known the proofs to fade before the party most interested had seen them; besides, it does not correctly represent the picture as it will appear when finished, and must consequently misrepresent our work. To avoid this, our customers come now to the gallery to inspect their proofs.

Doctor. All right; no one can blame a workman for guarding his work until it is finished. Good day.

[Exit Doctor.]

AN OLD BATH.

BY E. F. GREENE.*

CAN the negative bath be over-iodized? has been one of the subjects of discussion before our Society for the last two or three meetings. The general opinion among photographers has been that what has been called a "pinhole" bath is an over-iodized bath. Mr. Hall's able paper on this subject at our last meeting† illustrated to us that it is not iodide of silver which causes pinholes. Iodide of silver, in excess of the amount dissolved in the solution, will precipitate to the bottom, or can be filtered out; but no amount of filtering will cure a "pinhole" bath.

If it is not iodide of silver, what is it; and can it be avoided? We are all aware of the trouble it has caused us, and if it can be avoided, it will confer a great boon upon the photographer. I will state that I am using the same negative bath I used fifteen years ago. Of course, it has had copious additions to it in the shape of nitrate of silver and water; and I can assure you it has been full of pinholes a great many times, and has had all the ills the bath is heir to; also it has been dosed and doctored by all the known remedies, but for the last five or six years I have adopted but one practice, as follows:—Pour the solution into an evaporating dish, and put in enough of bicarbonate of soda solution to make it slightly alkaline, and evaporate enough by heat to drive off the alcohol and ether; when cool, add water to bring it to forty grains to the ounce; then sun it for ten or twelve hours; let it stand until it is settled perfectly clear; filter, and it is ready for use.

It will require a few drops of nitric acid; but do not add the acid until after it has been filtered, as the acid will dissolve the dirt and foul matter, which will filter out when neutral. I have not taken any other method to get rid of what is called excess of iodide in the bath for the last five years; and I do not believe it is necessary to precipitate the iodide of silver in the bath. I have not discovered but what I can dip as many plates in the bath by this process of purifying as I used to when I practiced the old method of precipitating iodide of silver by adding water to the bath.

In the minutes of the meeting as published in the *Western Photographic News* for June, I am reported to have said that I used washed iodide of silver to iodize the bath; it should have been credited to Mr. Hall. I dissolve iodide of potassium in water, and add directly to the bath. The quantity the bath will take up is so very small, there is no use in going to the trouble to prepare washed iodide of silver. One grain of iodide of potassium will saturate thirty-two ounces of forty-grain bath; that quantity cannot injure it when a bath which has been in constant use for years, and has had thousands of plates dipped into it, remains in good working order now, and is better than a new one.

The members then discussed the subject at some length. Question by a member: How many plates can be immersed in a bath before pinholes appear? Mr. Greene said he had dipped one hundred 5 by 8 plates in a 7 by 9 bath. Mr. Smith said he used three-quarters of a grain of iodide to

one grain of silver. Mr. Greene used a bath saturated, or added iodide as long as it would dissolve, until there was a sediment at the bottom. Mr. Drummond had used gelatine to get rid of the water in the collodion, still there would be pinholes. He had put three or four ounces of water in a bottle, poured his silver bath into the same, filtered, used, and found the pinholes had all disappeared.

VIOLET GLASS FOR STUDIOS.

REFERRING to the statements of M. Sottellari regarding the use of violet glass, Mr. Gaffield, of Boston, U.S., writing to our Philadelphia contemporary, says:—

"I have only to say that such a claim is in entire contradiction of all my experiments for the last nine years with colourless glasses of many kinds and glasses of all colours. My experiments have all been made with paper sensitized with chloride of silver. The poorest kind of colourless glass, and even those kinds which have been changed to a yellowish or purple tinge by exposure of years to sunlight, will transmit a much larger amount of the chemical rays than the most actinic of the really coloured glasses, the blue and violet.

"I have never made any experiments with iodide or bromide of silver, and I shall not have time with my present occupations to make any before the publication of your next number. I have no idea that any different results will be attained, and I have not seen any photographer in Boston who 'takes any stock' in the so-called 'invention,' which is said to be patented in France.

"I would like to add, that in a series of photo-metrical experiments, made by Professor Frederic E. Stimpson and myself in 1867, we found purple or violet glass to cut off about 90 per cent. of the light rays. I have never yet expressed in mathematical terms the amount of chemical influence cut off by coloured glass, but I should think that violet glass would transmit from 25 to 30 per cent. less than any colourless glass.

"Under the circumstances, it is difficult to conceive of the remarkable effects named under violet glass. As Professor Stebbing says, 'The fact is, an error is committed by him, or that iodide and bromide salts are more sensible to violet rays than chloride of silver, with which the experiments of Mr. Gaffield were made.' I think it would be well for some competent person to seek the truth, for it interests the whole photographic community."

"I do not pretend to be the 'competent person' suggested by my friend, Prof. Stebbing, but for my own gratification, and as soon as I find opportunity, I hope to make a few experiments on iodide and bromide of silver under colourless and coloured glasses, and will communicate the results to you."

PRODUCING A LARGE PHOTOGRAPH.—At a meeting of the Philadelphia Photographic Society, at the request of one of the members, Mr. Clemmons gave an interesting account of the manner in which he successfully albumenized a single sheet of paper measuring 10 feet 7 inches by 20 inches, which was afterwards used for a mammoth print of the Centennial Grounds from George's Hill. A wooden dish was constructed, 11½ feet long by 27½ inches wide; this was first painted white inside, then coated with shellac, and finally waxed, pure bees-wax being well rubbed into the seams by means of a large piece of cork. The salted albumen was now poured in, covering the bottom to the depth of about ¼ of an inch all over, and it required the whites of 125 dozen eggs. The paper, after being soaked, was carefully lifted off by two persons, and secured to a long pole by its upper edge, galvanized iron tacks being used for this purpose. Seven different negatives, each 18 by 22 inches, were used in the printing, the edge of each being blended with care into that of its fellow. For making the negatives, the back combination of a 21-inch Ross symmetrical lens, 42 inches focus, was found to be the only lens at hand giving the required field and definition. Photographed by J. Gutkunst, Esq.

* Read before the Chicago Photographic Association.
† See page 293 in our last volume.

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THE COFFEE PROCESS AGAIN.

THE coffee dry process seems more than ever a favourite, especially with amateurs abroad. Colonel Baratti, it will be remembered, was one of the early workers with this process; while many other distinguished amateurs on the Continent, with the late M. de Constant at their head, seem never to tire of singing its praises. A correspondent in Switzerland lately sent us some examples of the process which, by reason of their depth, vigour, and richness, were equal to the best wet-plate photographs, and now both M. Haakman, the president of the Photographic Society at Amsterdam, and M. Victor Angerer, a well-known Viennese photographer, bear testimony to the efficacy of the process.

M. Haakman says he has given some attention to dry plates, for, as he practises photography simply for pleasure, these are generally more convenient to use than wet films. He has tried, he tells us, tannin, tea, tobacco, morphine, and several other substances in the preparation of his dry films; but none of these, to his thinking, afford such clean and satisfactory films as coffee.

M. Haakman prepares his plates in the simplest manner; and although we have several times published formulæ in regard to the production of coffee plates, our readers may like to know the precise plan followed by M. Haakman. His coffee solution is made up of

Boiling water	...	100 cub. cents.
Pure Java coffee (burnt)	...	5 grammes
White sugar, dissolved in a little water	...	2½ "

This infusion, when cold, is poured twice over the sensitized collodion films, which are then dried.

FADED LICHTDRUCK PRINTS.

SOME discussion arose a little while ago upon the stability of pigment or carbon photographs, and it was proved beyond dispute that some of the colours employed in the production of these pictures were liable to fade or bleach. An objection of the same kind has been lodged against Lichtdruck prints, and a case is mentioned in the *Mittheilungen* which certainly brings home the charge of instability in the case of a certain batch of such prints. Photographers who have taken up collotype printing have become callous, we suppose, in respect to the ink and pigments that they employ, and, in their endeavour to secure delicate and fine gradations, make use of colours whose charms are fleeting.

In a recent number of his journal, Dr. Vogel tells us

that, the other day, comparing some Lichtdruck prints, preserved in his portfolio, with pictures of the same kind which had been in a photographer's show case for some time, he was astounded to see the marked change these latter had undergone from the continued action of daylight. They had, first of all, lost the warm brown tone they originally possessed, and then gradually changed to a grey, the high lights becoming even yellow.

It is, of course, easy to avoid the use of fleeting colours, and photographers must do so if they wish the public to believe in the inalterability of their productions; unfortunately many of the cheaper and more delicate pigments to be purchased in commerce are very liable to bleach in sunlight.

FASHIONS IN PHOTOGRAPHY.

MR. FITZGIBBON, in his *Practical Photographer*, thinks that the journals have hitherto been negligent in failing to apprise the profession of the prevailing fashions in size and fitting of photographic portraits, and gives the following as the styles at present fashionable in America:—

CARD MOUNTS.

The most generally used is thick or heavy round corners, light buff, dark buff, green, grey, white, or rose tint.

A finer quality of cards are light buff, dark buff, white and amber, with broad, red borders.

Another first-class card mount is white, cream, opal, silver grey, rose tint, violet, primrose, green, fawn, steel grey or drab.

The most fashionable colors of enamelled are chocolate, white with gilt and tinted lines, pearl, pink, buff, green, rose tint, and primrose.

The finest quality, and fashionable, is the cream, pink, pearl, buff or green, with gilt lines. Also, white, primrose, green, pearl, pink, black or chocolate, with broad gilt and red borders.

The tinted backs, fine quality, are becoming very popular

THE CABINET

most used has round corners with figured and tinted backs; white, pearl, pink green, and primrose enamelled backs and unenamelled faces, with broad gilt borders. The finest used, and most popular at present, are black or chocolate colour, enamelled on both sides, with broad gilt borders.

The colours most in demand for a cheaper card mount are amber, green, pink and violet, with gilt lines; also black, maroon, or dark green enamelled backs, and unenamelled amber coloured face.

Slee's mounts of all sizes hold their popularity, and there is about fifty per cent. of the same used. The most popular and desirable colours are white, light and dark buff, amber, pink, rose, green, and violet. The most expensive are the fawn, drab, or steel grey. The lines on those mounts are purple or red. Victoria size, very few are used.

THE PROMENADE

generally are square corners. The finest and most fashionable are the pink, pearl, and chocolate, gilt edges. The next are amber, white, light buff, with red edges bevelled.

SOMETHING NEW.

The imperial and boudoir cards. The most fashionable colours are white, amber, pearl, tea, granite, blue, or grey with round corners.

THE CATHERSON

Ferro holder is something new also. They are very neat and attractive, and are of different tints.

STEREOSCOPE MOUNTS

range in popular colours like the card mounts. Three and a-half by seven is still the popular size, although a good many of the others are sold.

MATS OF ALL SIZES.

Most popular colour is white. Grey is also a favourite tint. Black and chocolate are coming into fashion.

HINTS TO AMATEUR CHEMISTS.

THE following advice to young chemists, given by Mr. W. W. Goodwin in a work on Analysis just published in America, is so applicable to the case of photographers, that we commend it heartily to all our younger readers:—

"Cleanliness is of the utmost importance. Never put away anything dirty. It takes twice the time to cleanse glass vessels when chemicals have dried on them than it does if washed directly after they are done with. Many persons have thrown away bits of dirty apparatus which they would have looked upon with pride had they polished them before putting them away. Do everything and arrange everything in order. Never be in a hurry or flurried; serious accidents may occur at times through not keeping cool. Have a place for everything, and put everything in its place. It is a good plan to make a list of all apparatus and materials required for the experiments which are to engage the attention. Satisfy yourself beforehand why you do everything, and never be content with making a thing merely do, if it is not done properly. Badly fitting corks, requiring lutes or sealing-wax to stop the leaks, must not be suffered at any time; another should be fitted. Many a serious explosion has occurred for want of these precautions. In all cases use the simplest form of apparatus for an experiment; unnecessary complications are confusing.

Take careful notes of experiments as they proceed, on paper or in a rough note-book. Dr. Hofman used to say, "The scrap of paper well stained with acids is of much greater value than the half worked-out though clean notes written after the experiment has passed away." The rough notes should be reproduced in a more finished form in a book kept solely for that purpose. The mere copying of scientific facts and formulae, previously learned in a practical way, is a great help toward remembering them.

Chemical operations should be carried on, if possible, in a room set apart for that purpose; it is better to have it on the ground floor, if possible, as water is more easily obtained, and waste carried off by drains. It should be well ventilated, with a flue in which there is a fire burning, or furnished with a ring of gas jets, to produce an ascending current. The flue may be furnished with a hood, under which experiments may be performed where noxious vapours arise. A zinc tube about two and a half inches in diameter, arranged over the bench, about a foot from the ceiling, with inverted funnel tubes over the gas-lights leading into it, can be arranged to produce an upward current, and will keep the room clear. This may be carried into the flue or out of doors. A chamber about two by one and one-half feet, with glass doors, should be fitted up in every laboratory, however humble, in connection with the flue, in which the experiments with sulphuretted hydrogen, &c., can be carried on. This, however, can be made to lead out of doors also, by having a Bunsen constantly burning, the waste heat being used for a mand bath, in which evaporations may be carried on, if the chamber be divided by a partition. The principal sink may be either in the laboratory or just outside, and should be of glazed stoneware, to resist acids. A small leaden or japanned iron basin may be let into the bench to carry off waste.

The room should be furnished with a working bench (say) two and one-half feet broad, round the wall, and, if necessary, down the centre. A nozzle, with a stop-cock, should be connected with the gas-pipe for attaching the flexible tube; narrow shelves should be fixed along the walls and over the bench, to hold the bottles containing materials and reagents. A cupboard or shelves may be put under the bench, and drawers fitted, to hold the various kinds of apparatus. Water must be at hand in a trough that can be emptied, or in pails.

FRENCH CORRESPONDENCE.

M. BOIVIN ON CARBON PRINTING: THE DIFFERENCE BETWEEN WEAK AND STRONG LIGHT—A NEW AND FACILE ENLARGING PROCESS—M. BOISSONNAS' STUDIES OF CHILDREN—FORMIC ACID DEVELOPER MODIFIED.

I THINK that the readers of the PHOTOGRAPHIC NEWS will not be averse to reading a note which I have just received from M. Boivin regarding the difference of sensitiveness existing between bichromated mixture and chloride of silver paper employed usually in the photometers. All photographers occupied in carbon printing must have remarked that the sensitiveness of the tissue they employ is very variable, according as the intensity of the light varies and the amount of bichromate salt contained in the material. The chloride of silver paper is, however, far more open to influences, and sometimes a photographic action will be remarked (after a certain exposure) in the tissue, while the chloride of silver has apparently undergone no change at all.

A very important point results from this observation; it is, that in a bright light it is necessary to prolong the exposure to a high number on the photometric scale, and in a weak light the exposure should cease at a low number. For instance, a cliché marked No. 3 on the photometric scale, and giving a good print in fifteen minutes' time, must be printed scarcely up to No. 3 degree, if as much as thirty or forty minutes are required to furnish an impression. If, on the contrary, the light is brighter than usual, and only eight to ten minutes are necessary to yield a print, then the exposure must be continued till No. 3 degree appears very pronounced on the scale. The chemical action is produced much more slowly upon chloride of silver paper by a weak light than a strong one, while in the case of the bichromated tissue, it is not the same under similar conditions, and under some circumstances, therefore, it is possible to produce carbon prints when silver impressions cannot be obtained. According to M. Boivin, it is this variation in the sensitive qualities of the two bodies which must of all things be borne in mind in producing good carbon prints, and it is by giving attention to this circumstance that he has been enabled to produce fine impressions with certainty. If photographers would only bear the fact that he has pointed out in mind, they would at once surmount one of the gravest difficulties connected with carbon printing.

An amateur, Doctor L. d'Hombres, a medical man residing in one of our little provincial towns, writes to me that he has discovered and employs a process of enlargement which necessitates no retouching at all, and gives at the same time the most beautiful results, which hitherto have been secured only by considerable aid from an artist. By means of his system, he assures me, there is no necessity for any particular arrangement or apparatus; the paraphernalia he makes use of is of the simplest, and he does not even possess the accomplishment of sketching. He produces, he tells me, prints of every dimension and the most perfect delicacy. The outlines are perfectly sharp, and they may be produced with the ease and rapidity involved in the preparation of carte portraits. If this is a true record of his invention, Dr. d'Hombres has certainly made a vast step of progress; but I can only speak by hearsay at present, and so far have seen no results produced by the new method.

A photographer of Geneva, M. Boissonnas, who has already distinguished himself at various photographic exhibitions, paid me a visit in Paris during the past few days, and took the opportunity of showing me some really wonderful pictures. They were portraits of children produced instantaneously; nevertheless, they presented all the vigour and modelling which are to be seen in photographs that have been fully and thoroughly exposed. Some were of babies crying, and some of little ones laughing; some there were in the act of lifting arms and legs,

and all of them were full of movement and life. Groups there were of children represented in the middle of a game, with a cat or dog in their midst. If not actually instantaneous pictures, they must have been secured with the shortest of exposures, so animated were the pictures. The four albums which M. Boissonnas exhibited to me included something like 800 prints of this kind; so that one may very well believe that the photographs represent a fair specimen of that gentleman's every day work.

In one of my former letters to the PHOTOGRAPHIC NEWS (Vol. XX, No. 951, page 561) I gave your readers the formula of a developing solution made up with formic acid, which permits of the exposure being materially shortened. The solution is composed of:

Sulphate of iron...	40 grammes
Sulphate of magnesia ...	40 "
Formic acid ...	5 "
Alcohol ...	30 cub. cents.
Acetic acid ...	10 "
Water ...	500 "

The author of this communication tells me that he has slightly modified this formula with the purpose of rendering it more manageable. For every 100 cubic centimetres of water he adds five grammes of glycerine, while the acetic acid has been reduced to four per cent. The formic acid should not be added until just before the solution is used. On development, the image appears rapidly, and then appears to sink into the film, if regarded by reflected light. Looked at as a transparency, however, all the details are perfectly visible. It is necessary to intensify by means of pyrogallie acid and silver. The collodion recommended for the preparation of plates is composed thus:

No. 1.—Ether ...	500 parts
Alcohol ...	400 "
Pyroxyline ...	10 "
No. 2.—Absolute alcohol ...	100 "
Iodide of cadmium ...	6 "
Iodide of ammonium ...	6 "
Iodide of lithium ...	1 "
Bromide of cadmium ...	1.25 "
Bromide of ammonium ...	1.25 "

The two solutions are mixed in the proportion of ninety per cent. of No. 1, and ten per cent. of No. 2.

ERNEST LACAN.

APPLICATIONS OF PHOTOGRAPHY TO THE CULTIVATION OF SCIENCE, ARTS, ETC., IN FRANCE, AS EXEMPLIFIED BY THE RECENT PARIS EXHIBITION.

BY M. A. DAVANNE.*

AFTER dealing with the applications of photography to scientific research, M. Davanne proceeds to show the value of the art in paleographic and numismatic studies, as also in respect to its worth in libraries, where it may be employed in copying rare historical documents. In support of this last important application of photography, M. Davanne quotes a letter from M. Leopold Delisle, the Director of the National Library of France, who says:—

"Photography should lead to a complete revolution of paleographic studies; henceforth the most important manuscripts may be reproduced with the most rigorous exactness from the first page to the last, and a day will arrive when all the large libraries in the world will have copies of those few antique volumes which are the glory of the museums at Rome, Florence, Milan, Vienna, Paris, and London. The Psalter of the University of Utrecht has just been the object of publication at very little expense at the British Museum, and thus students have put within their reach, and may with confidence study, one of the most curious monuments of caligraphy and draughtmanship of the eighth and ninth century."

* Continued from page 44.

Another example of how photography helps the student interested in these matters is to be found in the reproduction of a Popish Bull of Sylvester II., which is dated 3rd November, 999, and which carries the signature of Pope Gerbert. This instrument, once reproduced upon stone or metal, can be vulgarized to any extent, and thus documents are reproduced for a few pence which may be perused with as much confidence and advantage as the originals, that are so rare and valuable as to be jealously stored up from the eyes of all but a very few.

M. Davanne proceeds then to say something of carbon printing, and refers to the works of M. Braun more especially, some of which were shown at the Exhibition. The pictures of M. Braun, says M. Davanne, without being very numerous, possessed, nevertheless, more interest than those he has previously forwarded. Among his beautiful prints were to be seen reproductions of the paintings of Michael Angelo, in the Sistine Chapel, the merit of which reproductions is only to be appreciated when one takes into consideration the many difficulties that had to be overcome. As most successful in portraits produced in permanent pigments, M. Liebert and M. Beutlinger are cited, two Paris photographers who have already won a reputation for themselves in other branches of the art.

Turning to photo-enamels, M. Davanne says that the transformation of a cliché into a vitrified enamel is one of the most delicate applications of photography, demanding, in order to be successful, a very great degree of skill, not only in regard to the manipulations connected with the muffle furnace, but also in respect to the development of the image with fusible pigment, in which operation the hygrometric condition of the atmosphere plays a very important part. This branch of photography is most suitable for portraits, apparently; in some of the enamels exhibited in Paris the brown tone which is usually adopted was replaced by tints of various shades, which proved that the photographer had been exceedingly skilful in his retouching labours. The process is destined to be very generally developed, and when it has been well cultivated we may hope for enamels at a much more moderate price.

Photography in greasy ink naturally calls for M. Davanne's earnest attention, and he states that a transformation of a photographic cliché taken from nature into a printing block from which any number of impressions can be struck off in greasy ink is one of the most important problems which photographers of the future will have to solve. The perfect realization of this problem in all its ramifications will constitute an immense stride of progress which will at once modify all our graphic arts; and it is with this aim in view that many have striven far on the way to success. So far, the mechanical processes might be divided into three classes, impressions being struck off a gelatine surface as in lithography, or produced from intaglio or relief blocks.

M. Davanne concludes his report with a glance at the improvements made in photographic apparatus as exemplified by the instruments exhibited at the recent Paris Exhibition.

ON THE CLEARNESS OF THE ATMOSPHERE—A QUERY.

BY NELSON K. CHERRILL.

PHOTOGRAPHERS in England, and, perhaps, elsewhere, are accustomed to hear remarks from their clients, which point to a wide-spread belief that clearness of the atmosphere is an essential condition to the success of photography. Englishmen who have travelled are, as a rule, rather inclined to be "down" on the home photographers. Who does not remember hearing often enough the photographs of Italy or Belgium compared with English work, to the detriment of the latter; and the reason set down as final and conclusive that the wonderfully clear atmosphere in these countries is the sole and simple cause of the superiority of the photo-

graphs produced in them? I do not suppose for a moment that an exceptionally clear atmosphere would make any perceptible difference in the quality of a portrait taken in the studio; indeed, so far to the contrary, some of the finest portraits I know of have been taken in weather quite the reverse of clear. How far clearness of the atmosphere in its extreme qualities of perfection would affect a landscape photograph, I have no means at present of knowing.

When I was in England, and people told me of the clearness of the air in other countries, I did not understand them; that is, I did not appreciate what was meant. I had been accustomed to certain views of landscapes in nature which I had seen under a hundred variations of light and atmosphere, and I simply concluded that "a very clear atmosphere" meant the same as in England, on a clear day; that the clearness spoken of, in fact, did not so much refer to a different quality in the air to that well known in England, but that it simply meant that the air was always as clear as when at its best in England. There is, however, in New Zealand a different quality in the air, or, perhaps, more correctly speaking, a more exalted condition of the quality of clearness, than anything I ever saw in the old country. Christ Church is situated on the border of a great plain, at its narrowest part about forty miles in width. The plain is bounded on one side by the sea, and on the other by a chain of mountains. The plain, however, itself has a gradual slope, being about twelve hundred feet above the sea level at the foot of the mountain ranges, and gradually sloping down to the sea level at the water line. The mountains rise suddenly from the plain, and reach various elevations, from two to six thousand feet; farther back are other ranges, from five to ten thousand feet above the sea level. I give these particulars somewhat in detail, because they will serve to make what I have to say more intelligible. These mountains, then, are visible from Christ Church; but, if that were all, it would not be saying much, as, of course, objects might be visible in England if their heights and positions relative to the observer were the same. This is not all, however, for not only are the mountains visible, but all the details on them. You see where the snow lies, and where it does not; you see in the morning light where the gullies and ravines run into the main chains; you see the spurs and minor ridges, and can make out clearly the outlines of tracts of bush, &c.; the paths of the rivers coming down, and the positions held by the glaciers, are also clearly distinguished. Now this, I say, evidences an atmosphere possessing greater qualities of clearness than is ever experienced in England. It is simply impossible for a new-comer to these parts to believe that the nearest of the mountains, seen with the clearness I have attempted to describe, is forty miles distant; and that others, apparently almost as near, are fifty, sixty, and some seventy miles away. If any of my readers will get a map of England, and set off on a slip of paper forty, fifty, or sixty miles, and then hand it about in various positions, they will get a better notion of what I am writing about. I am perfectly familiar with the appearance of Calais heights as seen from Dover, and I can confidently affirm that Mount Somers, which is sixty-five miles distant from here, can be seen often quite as clearly from hence as Calais from Dover. Mount Somers is about six thousand feet, I believe. Now, the question is, if Calais cliffs could be pushed up to six thousand feet instead of, perhaps, six hundred or less, would they be then seen as clearly from Gravesend as they are now seen from Dover? And this brings me to the point I wish to raise, namely, can any of your scientific readers suggest a plan for observing accurately what is the exact amount of clearness possessed by the atmosphere at any given time, so that the observations could be made in various places, and ultimately compared? At present we measure with exact precision the weight, moisture, and other physical qualities of the atmosphere; but I have not seen any description of apparatus or suggestion of method by which its clearness can be determined. If any of your readers can suggest any

method likely to ensure a fairly exact result, I should be happy to make a set of observations in this country for comparison with those which may be taken elsewhere. It will be seen at once that any plan for making such observations as these must be one capable of being carried into effect in such a manner that the result shall be easily comparable with those obtained by other observers. Such a comparison of results obtained in various parts of the world would be interesting, if not valuable.

Shortly after landing here I met with a curious instance illustrating the above remarks. There is a small range of hills apparently close to the town (between it and the port). I often said to a friend, "Let us go and get up on those hills," whereat he laughed; he thought it ridiculous that I should insist on wanting to do a twelve-mile walk, whereas I thought him ridiculous for making any difficulty about a four-mile stroll of an afternoon. One day I determined to go alone, and found it over five clear miles to the foot of the hills, and they don't look above a mile and a half or two miles off—that is, judging by what I had been accustomed to all my life. I should have said the hills were that distance on account of the apparent clearness of the bushes, rocks, grass, &c., seen on them. I mentioned the effect to several old colonists, and they all agreed that though such appearances had now become quite natural to them from custom, at first they were all in like manner deceived by the clearness of the atmosphere. The question is, can any of your readers suggest, not a remedy, but a means of estimating exactly the boon? Can they, in short, suggest an accurate means of gauging the clearness of the atmosphere?

PHOTOGRAPHING CHILDREN, ETC.

BY FORESTER CLARKE.*

ONE of perhaps the most difficult things under all circumstances that we are called to do, is to make negatives of children from two to four years old—these sly little youngsters, of just that age too large to sit in a high chair or on its mother's lap, suspicious of everything new, and frightened to death at the sight of a head-rest, perfectly understanding everything that is said or done, but have not the least idea of obeying, or rather, cannot be made to mind for love or any number of promises of money, candy, dolls, or trinkets, of the thousand-and-one kinds lied about every day in the week. And is it not surprising, when we stop to think of it, how really ignorant most people are in such things, what ideas they have in regard to their children's pictures, and yet how very confident they are that they know fully as much, if not a little more about it, than the photographer himself?

If a child has lived to be two years old, especially if it is the first one, it is too large to be taken sitting, and they have decided to have it taken standing, and if the lady brings with her an aunt or grandmother, they are sure to advise with her rather than ask the photographer anything about it. Sometimes three or four extra hands come along, and all expect to come right into the operating room "and help." In my own practice I have often found it more work to get rid of the extra help, and get the room quiet, than it has been to make the child's picture.

These aristocratic people have an idea that they are perfectly competent to assist, and they do not choose to be slighted. I have had more trouble of this kind from lawyers' and doctors' families than from any other trade or profession.

One doctor—a very high-minded and high-strung Englishman—wife, and child, came into my rooms some time since, walked into the dressing-room, laid off their things, came right into the operating room. The wife proceeded to place the child in position, and the doctor, with the idea of making himself useful as well as ornamental, looked around until he got a bell or something else, and

* *The Practical Photographer.*

then, with all his elevated notions, his English, &c., commenced parading himself up and down in front of my camera, to interest the child, while the mother was holding it. I spoke to him quietly, told him that was all unnecessary, we should do much better if everything was still until we were all already, and added that I felt quite confident that I was able to do the work; but he took no notice of me or my suggestions. I gave him several hints to sit down and make less show, but he did not take it in that way. I then said, "Doctor, please be seated; if I need your assistance, I will call on you." "But, look here, sir," said the M.D., "I want you to distinctly understand, sir, that this is our child, sir; and we want it taken just as we want it, sir!" "Well, now," said I, "when I come to your office and need your services, I will tell you exactly what I want, and then I expect to follow your directions; but here you come to my rooms for my services; ought I not to have a chance to work without any interference?" He did not accept my position at all; would not notice it; said, "We came here expecting to, at least, be treated decently, but, on the contrary, you have been insulting, impudent, overbearing, and saucy, ever since we came into your rooms." I quietly replied the whole charge; he was never worse mistaken in his life, &c.; and he finally settled himself on a neighbouring chair. And I made the negative so that they were quite well pleased with the picture; but I have not yet had occasion to call at his office to engage his services.

One of the 'cutest little tricks that I have learned, with most of the little fellows that are able to understand at all, is: first, to be careful that the mother does not get a chance to give the child a lecture on behaviour in the reception room—a most detestable practice. Who has not been most fearfully annoyed in finding the little things standing or sitting as stiff as little posts? And then you have first to undo all they have done by talking to them, before you can possibly put them in any half-way decent position. Tell the parents not to say anything to the child about pictures; find out its first name, so you can address it in a familiar way; have your room and plate all ready; the mother and child only come into the operating room. Now, mamma, let me do the talking. "Well, Johnnie, you came in to see mamma have her picture taken, didn't you?" "Yes, sir." "Well, mamma may have a seat right over here by the side light, and you, Johnnie, may come and see me fix her head in this little rest;" and he has a chance to see it all. "Well, now Johnnie, you climb right up here where you can see me—that is a nice place; I will tell you how I sit my little boy when he comes out here; sometimes he puts one foot right under the other knee—splendid; you are such a nice little fellow that you may take my little boy's rest, and have your head rested just like mamma's, there now, we will see if we can see mamma through here." "Oh, yes!" "Now, sometimes I count one, two, three, four; let's try that just once more, or perhaps with music." If the child is one that can be talked to at all, I hardly ever fail of getting most any position I want, and the little fellows seem pleased enough to see mamma get her picture taken.

Correspondence.

NOTES ON CARBON.

SIR,—It is gratifying to find M. Lambert so successful with carbon in America. A great enameller, on his return from the Philadelphia Exhibition, gave it as his opinion that the climate was too hot. Perhaps it was, with two process-vendors in the field, one a *burnt-in* man, the other claiming absolute permanence by a process which is no secret.

The Chromotype process is simple and clean, the material inexpensive and of the best possible quality, the results superior in colour to any enamel I ever saw, and it can be worked in the hottest weather of America. It is quite true that in this country some of M. Lambert's pupils found

many troubles when the hot weather of last summer came upon them. It is quite true that the most eager to abandon silver printing had to return to it, in the high pressure of business and the high register of the thermometer; but it is also true that a goodly number of carbon men had become so familiar with the process that they found no trouble with hot weather, or any other of the dozen difficulties found by alarmists. It will put new fire into the breasts of those who are a little faint-hearted, and of those who too frequently look back to their old love—silver—instead of trying to unlearn it, to know that the Americans are also recognizing the improvements of M. Lambert.

The Autotype Company are now to give extra facilities of intercommunication amongst licensees, so that any seeming difficulty in the process can be explained, and the faults in manipulation corrected. This is indeed a great concession by the Company, and likely to prove of mutual advantage. It is wasting time for "One Anxious to Learn" waiting to pick up the process. There is only one legitimate and honourable course to pursue, and that is to come down with the dollars, secure the right to good material, a course of instructions where the process is successfully carried on, and every reasonable difficulty met with explained away, through the Company and their licensees. All those anxious-to-learn gentlemen may "pick up" good things in your able paper about carbon, but it is the interest of M. Lambert's licensees to keep a few good wrinkles to themselves. The great discussion at the Photographic Society's meeting the other week clearly proves that the process is a success, but nothing could be picked up there—not a hint. I cannot understand how a man could go round giving demonstrations, even "for a fee," and make the lame excuse that his tissues was too old. If the demonstrations were a failure, "Another One Anxious to Learn" should have withheld the "fee;" indeed, I don't see why he didn't teach his printer to do carbon himself, and save the "fee." I am rather afraid there are too many anxious to learn, but only at the expense of threepence a week for your able and enjoyable PHOTOGRAPHIC NEWS. The Chromotype process, as perfected by M. Lambert, is the result of an expenditure of capital, labour, and research incalculable: little wonder, then, that those who work the process don't tell everything. It is penny wise and pound foolish to linger. Go in for carbon, I say; even the enlargements will refund you in a short time. The Edinburgh Photographic Exhibition was very successful, but I was surprised to find so little carbon work by resident photographers, and greatly displeased to see a very bad silver print—that is to say, a faded print—awarded a medal. When in Edinburgh, I learnt that there were only two photographers who had the right to practise carbon printing under Lambert's patents. No wonder poor Edina is far back in permanent printing when this is the case. It is too hard on Scotland to have her chief city photographers kept out of a good thing in this way; it is all our interests to reform this if we can. How are we to help the photographers of Edinburgh?—Yours, truly,

JO. VESTRIA.

PHOTO-TINT.

SIR,—Our attention having been called to an article in the YEAR-BOOK entitled "Photo-tint," by Mr. E. Cocking, in which his ingenious method of tinting silver prints is described, we think it desirable to explain to your readers that this bears no relationship to the process of mechanical printing in permanent ink which we ourselves have recently introduced under the name of Photo-tint, and for which the bronze medal has been awarded at the Edinburgh Photographic Society's Exhibition. We need scarcely say, that at the time of our adopting this as a distinctive name for our method of printing, we were quite unaware that it had ever been used to describe any other.

—We are, sir, your obedient servants,

R. J. EDWARDS AND CO.

61, Fleet Street, E.C., January 25.

[It is unfortunate when the same name is adopted to indicate two distinct processes. Mr. Cocking's pretty results were described some years ago under the term Photo-tint; but, as he observes in our YEAR-BOOK just issued, no attempt has been made to follow up the idea, and hence the name was not generally familiar; and it is easy to understand how, in ignorance of its former use, it was adopted by Mr. B. J. Edwards, to designate his very excellent results in photo-collography.—Ed.]

NITRATE OF IRON DEVELOPER.

SIR,—Dr. Diamond having, in the YEAR-BOOK OF PHOTOGRAPHY, expressed his willingness to afford "further information" to any of your readers on the use of the nitrate of iron developer, I shall esteem it a favour if he will kindly give the precise method of making developers which will produce a dead silver surface, as also the modifications referred to in his communication. He will, perhaps, also state the strength and acidity recommended for the silver bath solution. I have made some beautiful pictures by following the system published some years ago by the late Mr. Sutton, and can quite confirm Dr. Diamond's statement as to their permanency over, at least, a period of twenty years.—I am, sir, your obedient servant,
Ryde, January 23rd. F. M. Z.

HEALTH OF PHOTOGRAPHERS.

DEAR SIR,—The suggestions contained in the quotation from the *Philadelphia Photographer*, as to the precautions advisable to be taken by photographers to guard against disease, are well worthy the consideration of the profession; but I fully believe the greatest evil is the very careless and irregular manner in which many operators take their meals. It is a common thing for them to be engaged in the studio from morning until evening, working in an unwholesome atmosphere, and under a hot sun, the only sustenance taken during the whole time being, perhaps, just a light luncheon. I venture to say, that no constitution can stand against this for many years; and my own opinion is, that if persons engaged in photography were always to take a substantial meal in the middle of the day, we should hear less of the cry that it is an unhealthy occupation.—I am, sir, yours truly, ALFRED HARMAN.
79, High Street, Peckham, February 1.

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.
The ordinary meeting of the above Society was held at the Commercial Hotel, Bradford, on Monday, the 8th inst, Mr. SMITH, the president, in the chair.

The minutes of previous meeting having been read, and received confirmation, Mr. John Lightfoot was elected a member.

Mr. BRAYBROOK then read a paper on "Carbon Printing," which will appear in our next.

The PRESIDENT remarked that it was not the first time the Society had devoted an evening to carbon printing, as Mr. Greaves had, on a previous occasion, given a practical demonstration of the process. The subject was an interesting and important one, and he was anxious that all the members would, as far as possible, take part in the discussion.

Mr. WORMALD LUDS said that he had not had a large experience in carbon printing, but from what he had done he did not intend to issue any more of his larger pictures in silver, as he could get a superior result in carbon, as well as insure permanency. He then handed round a number of prints in carbon, 26x21, with matt surface, which were of fine quality, and much admired.

Mr. SMITH thought the length of time allowed for drying the prints in the final transfer was unnecessarily long; providing the moisture could be got rid of, he did not see that any particular time was necessary, and suggested that instead of placing the whole of the print under pressure, it should be put in some sort of frame, which would keep down the edges, and allow the air to have free access to the back of the picture, thus facilitating the drying of it.

Mr. ILLINGWORTH was of opinion that a slow drying was best, but thought a good gloss could be obtained in a shorter time than had been stated to be necessary. The experience of the members varying very much on this subject, it was agreed to put the matter to practical test.—Mr. Sachs, representing the slow drying, would submit prints dried forty-eight hours; and Mr. Illingworth prints dried in the shortest practicable time—and the members would be able to form their own opinion.

Regarding the question of drying tissue,

Mr. HOWARTH asked if a current of pure air was necessary, or could gas be used to obtain the dry air requisite?

Mr. SACHS said gas was very objectionable, and should not be used.

Mr. WORMALD stated that all his tissue was dried by the aid of a Bunsen gas burner, and he had found no harm to result.

Mr. COCKING was of opinion that dry air, pure, was much better than using gas, and mentioned that he had adopted a method which might be new to some of the members, that of pinning the tissue with its back round a roller of plaster of Paris, which rapidly absorbed the moisture, and allowed the tissue to dry very quickly, and he suggested the use of the plates of plaster for placing between pictures, when mounted for full gloss, for the purpose of absorbing the moisture from the mounting boards.

After some further conversation, a vote of thanks was passed to Mr. Braybrook for his paper, and the proceedings terminated.

Talk in the Studio.

WEST RIDING PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, to be held Monday, February 5th, at the Commercial Hotel, Tyrral Street, Bradford, Mr. J. Crosthwaite will read a paper on the "Dusting-on Process."

LIGHT, AND SCARS FROM SMALL-POX.—Mr. Isaac Gregory, F.R.G.S., Principal of Merchants' College, Blackpool, calls attention to the fact that "pitting" in small-pox is chiefly due to the actinic effect of light reaching the sufferer's face, and recommends the use of actinetic yellow blinds in the patient's room.

STAGNATION IN PHOTOGRAPHY.—Dr. Vogel, writing to *The Philadelphia Photographer*, says:—"Though war is only as yet approaching, the dulness of business here is already very great. The ateliers are empty, and some are closed entirely. From all sides we hear complaints. But I must say that I found the decrease in trade, in a great many respects, far worse. Dr. Weissenborn, an eminent member of our society, finds the cause of this stagnation to be, that the public are surfeited with photographs. The public is tired of the carte-de-visite and cabinet photographs, and he believes that we ought to try something new, in order to bring the business up again. He proposes, as a new idea, transparencies in carbon. They can be produced easily, look handsome, and bring money. Besides that, he recommends the production of more portrait stereotypes. The propositions have something in their favour, and perhaps not only for Germany, but also for America, where there is now at least more attention paid to the carbon process. Nevertheless, we ought not to overlook that the cause of this quietness in business is not only the surfeit of the public with photographs, but the present general business calamity over the whole world."

PHOTOGRAPHIC SALVAGE.—Mr. J. Walter, writing from Lyme Regis, Dorset, says:—"Perhaps the accompanying item of news may be of interest to some of your readers; if so, it is at your service. During the past week, amongst a variety of articles washed ashore and picked up at sea, within a few miles of this place, was a case of collodion, containing forty-four pints of plain collodion, but labelled collodinum. There had probably been fifty bottles, as some were broken. Each bottle was corked, and a piece of bladder tied over the cork, whilst the stopper with which each bottle was provided was tied to the neck. A small quantity was handed to me by the Collector of Customs (who is also Receiver of Wrecks) for testing. I found it quite uninjured by salt water, none of which had entered the bottles, and on adding the usual proportion of Mawson's Iodiser, as supplied with their collodion, it produced a rather thin but very sensitive collodion, with which, on a dull afternoon, I took a clear negative, full of detail, in ten seconds. The negative would have been better, probably, for a shorter exposure; but I was called away, and had not time to make further experiments. The whole will probably be sold in a week or two for salvage."

The Photographic News, February 9, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE INTERNATIONAL EXHIBITION FOR 1878—PHOTOGRAPHY AT THE THEATRE—GLUE WITHOUT GELATINE.

The International Exhibition for 1878.—The Paris Exhibition for 1878 should be a success. The German Government seems to have withdrawn its opposition—for a refusal to take part in the gathering practically amounted to this—and there is now every reason to believe that support will be forthcoming in this, as in every other direction. Probably the government at Berlin felt that the Exhibition would flourish without their aid, and hence they have hastened to appear virtuous while there is yet time. In this country the matter is being energetically pushed forward. Mr. Cunliffe Owen, the Director at South Kensington, who has been nominated Secretary of the British Commission, has proceeded to Paris, and declared that no pains shall be spared on the part of this country to render the International Gathering of 1878 as popular as possible in this country. He was authorized to state that His Royal Highness the Prince of Wales, the President of the Commission, had determined personally to use every endeavour to further the success of the undertaking, and that he should consider himself a working officer in connection with the affair. Under such promising auspices there can hardly be a doubt as to the well-being of the next International Show, and indeed the number of applicants for space already registered by the officials in Paris has exceeded the most sanguine expectations. We in this country hardly consider Paris a foreign city at all, from the circumstance, no doubt, that it can be reached from the capital as quickly as Edinburgh or Dublin. Such Englishmen as are not Cockneys by birth or adoption feel quite as much at home in Paris as they do in London, and hence a journey to the metropolis of France has come to be regarded as a very ordinary affair indeed in this country. In these circumstances an International Exhibition in Paris is looked upon by most Englishmen as convenient to visit as one in London, and is certain to attract as large a number of visitors from this country. In the case of less wealthy exhibitors, too—and we may include photographers in this class—there is pretty sure to be far more in Paris than can be gathered together in any other capital, by reason of the general come-at-ability of that metropolis. Our brethren who visited the 1867 Exhibition in Paris will remember that there was a better show of photographic work there than had previously been brought together. Spain, Italy, Austria, Germany, Switzerland, Belgium, &c., were better represented than was the case in our Exhibition, for the simple reason that the exhibitors had not so far to send. For the same reasons the Philadelphia Exhibition was so sparsely represented by less important exhibitors, for it was scarcely to be expected that men who had but a show-case or two to send would take the trouble to forward them all the way beyond the Atlantic. As our Paris Correspondent, M. Lacan, has already intimated, a very impartial manner will be adopted for choosing the juries connected with the Photographic Section. One jury—the Hanging Committee, as it might be termed—has already been chosen, the members being men well known to French photographers, half the number being taken from the lists of the French Photographic Society, and half from another official body, termed the *Chambre Syndicale*. This jury will decide upon the admission and hanging of all photographic work, but when they have done this their functions will cease. The award of honours will be delegated to a different jury altogether, which will be chosen by the exhibitors themselves, foreigners being represented in accordance with the number that may take part in the gathering. So far, therefore, the arrangements for the 1878 Exhibition may be spoken of with praise.

Photography at the Theatre.—We have already alluded to the debt which scene painters and costumiers of the theatre owe to the photographer, and in a new piece just produced in Paris, called *Dr. Ox*, the theme of which is taken from one of Jules Verne's wonderful stories, and the music supplied by Offenbach, we are told that photography has been employed more largely than usual in rendering the *spectacle* as truthful as possible. The scenes in some cases are accurately painted from photographs, so that the public have before them something more than fantastic sketches. In like manner, pictures of costumes taken in different parts of the Netherlands have served as a guide in designing the brilliant dresses worn by the *dramatis personæ*. In one of the London theatres lately, a very fine view of the *Mer de Glace*, and of the Lake of Lucerne, also attracted much attention, which had been so truthfully delineated that in the first picture the characteristic masses of ice were as perfectly rendered as in the photograph itself.

Glue without Gelatine.—Photographers are quite aware that the glue they employ often varies in quality and in adhesiveness. If they are curious to know why this is, an excellent paper on its manufacture appears in *Dingler's Polytechnisches Journal* which throws a good deal of light upon the subject. Steam, it appears, is generally used in its preparation, and if this heating medium happens to be of too high a pressure, then the glue prepared is of inferior quality. Indeed, M. Terne finds the inferiority of the product is directly proportional to the pressure of the employed steam, until at length, if the operation be carried too far, all the gelatine is destroyed. Thus, it appears, we may purchase glue which is altogether innocent of gelatine. A material, we are told, which, at a pressure of twenty pounds per square inch, yields a tolerably good product, given at a pressure of thirty pounds or over (the time of boiling being in both cases the same) a glue, if it may be called by that name, which is perfectly white, and does not contain an atom of gelatine.

THE COLLODIO-BROMIDE EMULSION PROCESS APPLIED TO TRANSPARENCIES, AND ENLARGING WITHOUT A NITRATE BATH.

BY WILLIAM BROOKS.*

Stereoscopic Transparencies.—It is to be regretted that stereoscopic pictures are so little in demand at the present time; I allude both to the ordinary paper slide and the transparency on glass. The latter, to my mind, if properly made, is one of the most beautiful productions of the photographic art. I attribute the falling off in the demand for the ordinary paper slide (to be viewed by reflected light) to the enormous amount of trashy stuff the market has been glutted with—looking abominable out of the stereoscope, and much worse in it.

The great drawback to the glass transparency, I think, has been its price, the best ones being made by a very tedious process on a film of albumen, which is liable to fade. I do not think that at the present time a good slide can be obtained at less than five shillings and such a price is far too high for persons of limited means to purchase. A moderate collection—say fifty slides—at the price mentioned would come to a good round sum, more than many could afford, and therefore they go without them altogether. The great cry of photographers at the present day is for something new that would create a demand; now, this branch of the art is one that has been but little worked, and the little that it has been worked has been done in a very expensive way. I think the generality of photographers are very conservative, and will not do anything unless it can be done with the nitrate bath, &c.; for if one happen to mention anything about emulsion work, dry plates, and the like, they begin to pull a long

*Read before the South London Photographic Society.

face, and say they don't believe in it, and still go on in the old jog-trot sort of way.

I have tried the nitrate bath, iron development, and pyro development for stereoscopic transparencies, and the results have always been cold and hard, with inky tones, and very coarse. I can find nothing for their production like the emulsion process worked in the way I shall describe, and show you the results of my experiments. I am able to obtain all the warm tones exactly the same as we see in our well toned silver prints—a nice, rich, warm chocolate brown, rivalling those I before mentioned, as produced on the albumen films; and they can be produced and retailed in the market at about two shillings and sixpence each, leaving a good margin for profit. If a good demand sprang up, they could be reduced still lower in price, which, I am sure, would cause a revival of the stereoscope. At the present time there are thousands, and, I may say, tens of thousands, of stereoscopic negatives stowed away in the plate boxes of the photographer, both amateur and professional. There are several methods by which transparencies can be produced.

No. 1.—Printing by contact is all very well if only one or two be required; but for commercial purposes it does not answer, as the negative becomes damaged in spite of every care that is taken in dusting both negative and plate, although contact printing produces very fine results. At the same time, to produce the subject in its proper position two glass plates have to be used besides the one that carries the collodion film, which has to be cut and the halves transposed, to bring them into their proper position (presuming the original negative has been taken with a binocular camera). In printing by contact the glass used must be perfectly flat and clean. In this case the plate must be albumenized with—

White of	...	...	...	...	1 egg
Water	...	...	...	...	1 pint

The plates can be either immersed in it, or coated with it while still wet, and set aside to dry. My reason for albumenizing the plate is, that in contact printing, if the film get punctured with small holes, it will sometimes crease up during development and spoil the plate. After the plate is thoroughly dry it is coated with a thin collodio-bromide emulsion, known as "washed emulsion," and set aside to dry, film outwards. I may also mention that it requires a little knack in coating the plate to avoid crapy lines. A pool of emulsion is poured on one end of the plate, allowed to flow downwards in a wave, and poured off at one corner, when the plate is rocked once or twice—not more—then bring the plate into a vertical position, and by this means, if the emulsion be in good condition, all crapy lines will be avoided.

After the plate is dry it is placed in contact with the negative in an ordinary printing-frame, and exposed to the light from one to three or four seconds, according to the density of the negative and intensity of the light. Care must be taken, in removing the plate from the negative, that it does not grate, as the film is very tender. Methylated spirit is now poured over the film and returned to the bottle, as in the case of collodion, and allowed to soak in for a minute or two. I do not hold with the plan of diluting the spirit, for if diluted it does not do its intended work so readily, and the development is more difficult; the film requires to be restored to its pasty condition as much as possible. If a quantity are being done, the best way is to use a dipping-bath with a cover.

On being removed the plate may either be washed under a tap, or immersed in a dish of water till all the greasy lines are removed, and the water flows freely over its surface. The plate is then placed in a little shallow glass tray, similar to that described by me in the *British Journal of Photography* for 1876, page 115. I find it very handy, and the progress of development can be readily seen, without any fear of its falling out when holding it up to the light to

look through it; it can be turned bottom up, yet sticks as tightly as wax.

I prepare stock solutions, which keep in stoppered bottles, thus:—

P.—Pyrogallie acid (English) ...	96 grains
Absolute alcohol (a.g. 805°) ...	1 ounce
B.—Bromide of potassium ...	15 grains
Water ...	1 ounce
A.—Liquor ammonia ...	40 minims
Water ...	1 ounce

After the plate has been sufficiently washed in a clean measure, take five to ten drops of solution P, three drops of solution B, one drop of A, half an ounce of water, and pour this over the plate. If properly exposed the image will begin to appear in about half-a-minute. The above quantity is for stereo size. If the image appear too quickly, add a drop or two more of solution B; if it comes up slowly, add another drop of A. When the developer apparently ceases to act, add one or two drops at a time of each of solutions A and B, which will give intensity. This system of development is the ordinary method adopted, but gives for transparencies a rather smoky colour when viewed by transmitted light. I find that I am able to get very pleasing tones, similar to those we have in our well-toned silver prints. Instead of using plain water, I use a solution of acetate of soda, which I keep as a stock solution—

Acetate of soda ...	4 drachms
Water ...	1 pint

This not only seems to impart a better tone to the picture, but it also appears to act as an accelerator. I also use a solution of phosphate of soda, if I wish to have a sepia tone. The phosphate solution is used in place of the acetate of soda solution, and in the same manner:—

Phosphate of soda ...	2 drachms
Water ...	1 pint

I will now pass round for your inspection specimens developed by both methods, which will fully corroborate what I have just stated. I have no doubt that using other neutral salts will give a greater variety of tone. Should the tone appear a little too warm in colour I give a slight intensification with—

Pyrogallie acid ...	8 grains
Citric acid ...	1½ grain
Water ...	1 ounce

with a drop or two of a ten-grain solution of nitrate of silver, as in the wet process.

I must not omit to add that the alkaline developer should be well washed off, and some dilute acetic acid flowed over the plate to neutralise all traces of ammonia to avoid stains. If black tones are required, give a much shorter exposure, and develop by either of the before-mentioned methods, not carrying the alkaline developer too far, but bring it up to the required density with the acid pyro.

Fix in a solution of—

Hypo ...	1½ ounce
Water ...	1 pint

Well wash, and varnish with a varnish made of white, hard varnish thinned down to the proper consistency with methylated spirit, adding about two drops of castor oil to prevent its splitting in time to come.

Instead of using ground glass—a good sample adding very much to the cost—I use an ordinary matt varnish diluted with ether, as it gives a much finer grain, and is very inexpensive, which must not be lost sight of. The slide is now ready for mounting.

No. 2.—Instead of printing by contact, use a non-distorting lens, and make the transparency in the camera in the ordinary way, using the plate in the dry state, as in the preceding method. The transparency also requires cutting for transposing; the best system, however, is to cut

the negative in half and transpose. By copying with the camera we also have the advantage of either reducing or enlarging the subject according to the amount of the subject to be included, and a mask put in the dark slide in front of the plate makes a much neater job. The development is the same as in printing by contact.

No. 3.—The plate is coated with emulsion, but instead of letting it dry, put it in a dish of water until all greasiness has disappeared, and expose in the camera while still wet. No substratum must be used in this instance. By this method the tones are different, giving a greenish hue. When fixed, washed, and dried, it is coated with a solution of india-rubber in benzole, and then with a rich collodion, alternately, several times, until a good rich film is obtained, similar to the Warnerke films. In the last coating of collodion I saturate it with white wax; this dispenses with the use of the ground glass or matt varnish. When perfectly dry the film will readily peel off; then it is cut and transposed, gummed at one edge of a cut mount, and bound between two pieces of glass. This system is more tedious than the former ones. I now pass round a slide made by this method.

Lantern Slides.—These can either be introduced by contact in the same way as the stereo slides (and developed also in a similar manner), or they can be copied from the negative in the camera, and enlarged or reduced at pleasure. At the last meeting of this Society, being the popular lantern evening, the whole of the slides I exhibited were made by this process. Most of you saw the kind of image they produced on the screen. Several members having wished to examine the slides themselves, I now take the opportunity of complying with their request. In making the slides it is better that they should be developed by the alkaline developer alone; and, as it is an important point to keep the lights of the picture bare glass, before fixing flood the plate with—

Aoetic acid (Beaumont's) ...	2 ounces
Water... ..	8 "

This appears to take up any deposit on the surface that may have taken place during the development. I have heard several complain that slides produced by this process looked cloudy. Varnish with diluted white hard spirit varnish, the same as mentioned in the former part of this paper.

Transparencies for Decorations.—These may be produced by the same process. I will leave you to judge how far I have succeeded by the specimens I have brought with me. I find that frames can be purchased in brass with chains for suspending these for window decorations, which answer the purpose admirably.

Enlarging without a Nitrate Bath.—If a negative be taken with the intention of producing an enlarged negative, I prefer taking the original on one of the dry plates before mentioned, using only alkaline development. If acid pyro and silver be used, it causes a granular deposit. It is true the granules are small; but when enlarged up to several diameters they are very offensive, as we all know. If the negative is to be printed from, and not enlarged, I quite agree with Mr. Woodbury that it is best to intensify with pyro and silver, the resulting print having a true dry-plate effect. The effect of this pyro and silver intensification is that it produces a very fine stipple, which gives softness, but will not do for enlargement; and I think this is why enlargements look coarse.

I prefer to make the transparency by contact, and develop by the alkaline method only. The enlarged negative is made in the ordinary way from the transparency, instead of using a plate prepared in the bath. The plate is coated with an emulsion, and immersed in water until the water flows freely over its surface; it is then ready for exposure. I have prepared an enlargement by this method, using alkaline development, followed by pyro and silver, to bring up the intensity. I have brought with me the transparency and enlarged negative, also some prints from the latter.

You will find there is not any coarseness, although I have enlarged it up to three and a-half diameters, and I now submit it for your inspection.

CARBON PRINTING.

BY T. R. BRAYBROOK *

THERE have been so many and such ably-written articles on this subject, that there appears to be very little room for me to say anything; but if you will give me your attention I will try to throw out a few hints that, at the least, will bring about a discussion from which we may all profit.

When a man first starts carbon printing (and there are a great many have started who at first cried the process down) he must determine within himself to overcome all obstacles and failures, of which he will find a great many; and he must bear in mind that it is only by practical working, day after day, that he gets to understand the process thoroughly. You must not begin by falling out with your materials until you have given them a thorough good trial, for in nine cases out of ten you are wrong, and not the materials. Your tissues may dry unevenly, or be insoluble altogether, if the room you dry it in is not in a proper condition. A room with a current of dry air passing through it is the best. You do not require heat, although in wet weather you must have a little. You can get the desired current by placing a ventilator, having a revolving top, in the roof of your drying-room. You will find by this method of drying that your tissue will hang straight from the lath you pin it to, and dry evenly, not curling and cracking, as it is sure to do in an over-heated room or where a great fire has been left burning. If you have only one piece of paper to dry, tie a piece of string across the mantelpiece, and hang the tissue in front of the fireplace, so as to get the current of air that passes from the doorway up the chimney. There is yet another advantage from the tissue being dried in this way: it is more sensitive than it would be if it had been dried rapidly.

Sensitize in a solution composed as follows:—

Bichromate of potash ...	3 ounces
Water	100 "
Ammonia	1 drachm.

The waxing solution is composed of five grains of wax to the ounce of benzole. Care must be taken that the wax and benzole are both pure; if they are not, your prints will be so very fond of the glass that they will not leave it. A plate that has once been used does not require cleaning again, but only the collodion scraping from the edges, and re-waxing.

To develop, always use two baths. Immerse the plate in the first with water just warm enough to remove the paper from the printed pigment; then you may pass your plate to the next bath, the water being a little warmer, to finish the picture; but take care not to hurry the development, or you will lose the half-tones and get chalky prints. It is better to over-print a little rather than under-print, as you can reduce with hot water; but you cannot add to the density.

After fixing, drying, and transferring, let your plates remain under pressure, between sheets of blotting-paper, for an hour or two at the least. I generally leave mine for four or five hours to absorb the moisture from the transfer, and to prevent the transfer-paper moving during mounting, as it is apt to do if you mount too quickly after transferring.

I mount in the evening, and leave the plates under pressure until the next morning. I then rear them up to dry, taking care that the room be not too warm, or else they will leave the glass before they are thoroughly dry, and will, of course, have an uneven surface. To obtain an even and highly-glassed surface, the prints should be from thirty-

* Read before the West Riding of Yorkshire Photographic Society.

six to forty-eight hours drying. I find that the longer they are drying, the higher the gloss and more even the surface. Not that, personally, I like very highly glazed pictures, but the public do; and as they have to pay for them, it is, of course, to our advantage to try and get it, and so please them.

Now for the last, but not least, of the difficulties of carbon printing—viz., vignetting. This, at the best, is a difficult task, and requires much practical experience, as you cannot look and see how the picture is going on, as you can do in silver printing; but with a negative having a light and suitable background you can get a very good vignette with brown paper and cotton wool, having a little piece of tissue paper over the brown, the same as in silver printing. You must, of course, move the frame about a good deal, because carbon prints are so much sharper than silver. For large work, cut out three or four shapes a little larger than one another—say an inch and a-half—take off the smallest when the picture is about half done, the next later on; and so on until the picture is printed, and you have the size you want. You may in this way get a very soft vignette.

In conclusion, I would say the process is so thoroughly practical that any photographer should be able to work it, provided he gives his mind to it, and has proper convenience and premises. If he have not the latter, he had better leave it alone, for it cannot be worked commercially in a sink, with one or two porcelain dishes and a kettle, and paper dried in the operating room, or in a room where a great roaring fire has been kept all day. This process is of great value in dull weather like the present, as you can do from fifty to one hundred per cent. more work than in silver, with the crowning advantage of all—namely, your prints are permanent.

PHOTO-COLLOTYPE PRINTING.

BY M. T. H. VOIGHT.*

It is not my intention to refer back to the early experiments with bichromated gelatine made by M.M. Niepce de St. Victor, Fox-Talbot, and others, neither to describe the more improved process of M. Tessié du Motay. I merely desire to put before the eyes of those interested in the matter, some details of the processes which have been practised since M. Albert, of Munich, brought forward his improvements, and rendered collotype printing an industrial art.

Everybody is perfectly aware that gelatine impregnated with bichromate of potash possesses the property of transforming itself, on exposure to light, into an insoluble mass, which has lost the property of swelling, like ordinary gelatine. If a film of bichromated gelatine is spread upon a substratum and dried, and then a portion of it is exposed to light for a certain period, a second part for a less period, and the third completely protected against luminous action, a surface will be obtained which, when moistened with water, will take printing ink in a graduated manner.

By passing over this film a leather roller charged with lithographic ink, the parts which have not been acted upon by light, by reason of the water that they absorb, will not take up the ink. Those slightly touched by light rays will permit ink to adhere in a slight degree; while such portions of the film as have been thoroughly acted upon by light will become quite black, because of the amount of ink that attaches to them.

It is upon this circumstance that photo-collotype printing is based. In the foregoing experiment we suppose things to happen as they do in lithography. It is, nevertheless, a recognized fact that the ink does not adhere with regularity to the portions of surface influenced by light if the film contain a greasy body or resinous matter. It is from this principle that the old and complicated process of M. Gémossier, published in 1869, proceeded.

* *Bulletin de la Société Française.*

The undermentioned solutions should be separately prepared:—

1. Of gelatine, 8.75 grammes are dissolved in 150 grammes of warm water.
2. Of isinglass, 3.75 grammes are dissolved in 90 grammes of boiling water.
3. Of white of egg, beaten to a froth, 60 grammes are dissolved in other sixty grammes of filtered water.
4. An aqueous tincture is prepared of—

Myrrh	...	...	2 grammes
Ammoniacal gum	...	...	0.75 "
Liquorice-root	...	...	3 "
Manna	...	...	0.75 "
Cane sugar	...	...	0.75 "
Milk sugar	...	...	1.50 "

The above being dissolved in 120 grammes of distilled water.

5. Bichromate of potash ... 4.75 grammes
- Bichromate of ammonia ... 2.75 "
- Water ... 120 "
6. Ammonia
7. An alcoholic tincture is prepared of—

Lupuline	...	...	3.75 grammes
Myrrh	...	...	3.75 "
Gum benzoin	...	...	2.25 "
Tolu balsam	...	...	1.50 "

8. A solution of nitrate of silver is prepared, made by dissolving 7.50 grammes of the salt in sixty grammes of water.

9. Iodising solution, made up of—

Iodide of cadmium	...	...	0.25 grammes
Bromide	...	...	0.125 "
One per cent. solution of gold	...	...	3 drops.

Before employment these separate solutions are mixed together in the following proportions:—

1. Solution of gelatine ... 120 grammes
2. Solution of isinglass ... 70.50 "
3. Solution of albumen ... 22.50 "
4. Aqueous tincture ... 22.50 "
5. Bichromate of potash ... 25
6. Ammonia ... 6 drops
7. Alcoholic tincture ... 7.50 grammes
8. Silver solution ... 2
9. Iodide and bromide solution ... 4

In the case of the Gémossier process, the plates only receive a single coating. Plates of glass of considerable thicknesses, with a ground surface, are covered with the prepared gelatine, and placed horizontally upon a tripod fitted with a proper levelling arrangement, and put into a drying box exposed to a temperature of about 50° Reaumur.

The plates thus coated, when dry and cold, are exposed under a negative, and thoroughly printed. With a little practice it is easy to judge of the progress of the printing by looking at the plate from below. After printing the plates are put into water, where they remain for half an hour, care being taken that the liquid is agitated from time to time. This operation is for the purpose of removing the chromium salts. This done, the plates are taken out of the water, and dried spontaneously; they are then covered by means of a sieve with a layer of flour one centimetre in thickness. Afterwards they are put upon an iron tripod, and placed in a stove, where the temperature reaches, after a while, 100° Reaumur, so as to coagulate the albumen; and, by softening the gums, to render them more adherent to the glass surface. The stove should be constructed like a pastry-cook's oven. The plate, allowed to cool gradually in the stove, is freed from its layer of flour, and is cemented, the image uppermost, by the aid of plaster of Paris, to a lithographic stone. It is then ready for printing.

Excellent results may be secured by this process, only it is very difficult to judge of the degree of heat necessary.

If the film is heated too much, it will not subsequently absorb enough water, and in consequence the whites take up a little of the ink on the roller being passed over the design; the shadows taking up a good deal, and the lights a little ink, the result is a flat monotone print. If the heat has not been sufficient, then the film will detach itself from the glass surface.

On account of these difficulties, the one-film process was abandoned, as well as the employment of resinous and saccharine matter, the uselessness of which was apparent.

At the present moment, with these exceptions, the foregoing formulae are made use of to produce a second film, the plates receiving first of all a preliminary film prepared in the manner to be described, for the purpose of assuring adherence without being obliged to employ a high temperature. Six grammes of gelatine are dissolved in 270 grammes of warm distilled water, to which is added 5.50 grammes of bichromate of potash. Then 112.50 grammes of white of egg are beaten, without any addition of water, to a stiff froth, and the gelatine solution, which must not be too hot, is added carefully; the mixture being allowed to stand for some hours, is filtered before employment.

The ground glass plate is covered with this mixture by the aid of a paper strip or glass rod, and the plate is subsequently dried at a temperature of from 20° to 25° Reaumur. This done, the plate is put into a printing-frame, the film covered with a piece of opaque fabric, and placed where diffused light can act upon it for about half-an-hour. Preparation of the plates to this degree may be proceeded with for some days before employment.

The operation is continued by applying to the plate the film which is to receive the impression, after the mixture which is to serve for this purpose has been warmed to a temperature of about 45° Reaumur, and filtered. The plate is maintained in a horizontal position in a water-bath (40° Reaumur), but it is moved to and fro a little, so that the coating already on the plate may become swollen and soft, and capable of being united in one homogeneous mass with the second film that has to be applied. This done, the plate is taken out of the bath of warm water, and, while the surface is still warm and wet, the liquid for the second coating is poured copiously upon the centre of the plate, which is inclined in turn towards each angle, so that a little of the liquid escapes, thus preventing any marked margin. The plate is subsequently dried in a stove at a temperature of 40° Reaumur.

(To be continued.)

CARBOLIC ACID IN THE CARBON PROCESS.*

It has already been pointed out in this journal that M. E. Friedlein, of Vienna, adds a small quantity of carbolie acid to the bichromate bath employed in the sensitizing of tissue, and this he recommends as a very useful precaution. In the December number of the *Photographische Monatsblätter*, the same gentleman once more refers to the circumstance, and points out the general advantage which accrues from the addition of this acid to all kinds of gelatine solutions employed in connection with photography. Particularly in the working of the Woodburytype process the addition of carbolie acid is to be recommended, for M. Friedlein has found that in the height of summer the gelatine becomes bad within two days—nay, even in one sometimes, if no precautions are taken to preserve it. A bad odour is expelled, and then the solution rapidly becomes limpid.

One per cent. of carbolie acid, added to a gelatine solution of a dilute character, was found sufficient to preserve the latter in an open vessel, winter or summer, and even when kept in a warm room for months; the only change perceptible being that brought about by evaporation, the surface of the solution becoming hard and parchment-like.

The addition of carbolie acid in pigment printing has

* *Photographische Correspondenz.*

one other valuable property. If a small quantity be put into the bichromate bath, it permits the preservation of the tissue in a sensitive condition for a week, and, at the same time, gets rid of many defects with which carbon printers are plagued. The only drawback is its somewhat unpleasant odour, but this is a slight disadvantage compared to the valuable properties with which it endows the tissue.

The following formula is recommended for the bichromate bath:—

Bichromate of potash	30 parts
Water	800 "
Fluid carbolie acid	1 part

and in summer—

Glycerine	6 parts
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The fluid carbolie acid is prepared by dissolving five parts of the crystallized carbolie acid by placing in hot water, and adding thereto one part of warm water.

NOTE ON THE CONSTRUCTION OF HEAD-RESTS

BY NELSON K. CHERRILL.

MR. EUCLID, in one of his ingenious problems, proves that two circles can touch each other internally only at one point. This is only a mathematical problem, but it is capable of a good many very practical applications, among which my present suggestion will, I think, be found of use among photographers.

A head-rest, as commonly constructed, consists in its essential features of a series of tubes or rods which slide into various positions through circular holes, and are maintained in their required positions by means of screws. This, viewed in the light of the proposition I have referred to, is, to say the least of it, bad engineering. Let us look at it. Here is the hole with the rod in it; they can only touch at A (fig. 1). To hold the rod firm, the screw is put in opposite: this holds the rod at *two places*, allowing it the tendency to lateral motion. To avoid this, the rod is usually made so

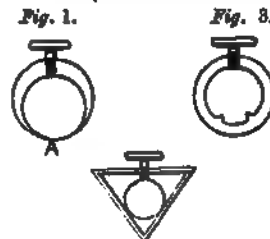


Fig. 2.

near the size of the hole as to fit almost tight, a condition which often involves difficulty in moving some parts of the rest, especially in the hurry of operating. If the rod were held at three places instead of at two—if, in fact, the round rod were put through a triangular hole, with the screw on one side of the triangle (fig. 2)—the construction would be far more perfect. It will be seen at once that a rod held thus would be more firmly fixed, with less pressure from the screw, than in the old plan. There is, however, one arrangement which I think would be better than this, and that is to have two projections made inside the ordinary circular openings in which the rods, &c., work (fig. 3); this would be practically the same as the triangle, but would be better in many ways: the projections might be made very small.

The advantages which would be found by adopting the plan above suggested would be that the various parts of the "rest" would be much firmer when screwed up than is commonly the case now; a much lighter pressure of the screw would also suffice, and hence the annoyance of finding screws tight "set" would be less likely to occur; lastly, by this plan, the rods could be made looser in the holes without loss of steadiness, hence greater freedom of movement when the screw is withdrawn.

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SUCCESS IN CARBON PRINTING.—THE OTHER SIDE.

THERE can scarcely be a doubt that carbon printing is the question of the day amongst photographers. The complaints of some, as much as the enthusiasm of others, are evidence of this fact. And it is clearly the duty of representative journals to give effect to every phase of the discussion of this question. In a recent article we remarked that tuition, either written or oral, was an indispensable preliminary to success; and there can be little doubt that in a new art of a manipular kind, personal lessons are of primary importance. But, after the best aid of that kind has been secured, there can be little doubt that very much must remain to be mastered by experience, and by passing through those failures which are proverbially the stepping-stones to success. It has been the legitimate boast of photography that the hearty and willing inter-communication of experiences amongst its devotees has been the chief agency in its rapid progress. And we need feel no hesitation in expressing our satisfaction that these pages—those of the first weekly journal devoted to photography—have contributed materially in facilitating such easy and rapid inter-communication of failure and remedy, difficulty and solution of the difficulty, upon which so much of success depends. That every legitimate complaint should have its expression, we regard as one of the primary canons of journalism, especially in technical journalism. And that, in the main, complaints are based upon a real difficulty or grievance, to be met with the best aid and information available, and not pooh-poohed as the outcome of incapacity or impatience, has been with us a settled conviction. Happily we have had the good fortune, as a rule, to be associated with a staff of contributors, and an army of correspondents, who have, in relation to the various processes, aided us in making plain a path through all kinds of technical troubles, and we have especial satisfaction in pointing in our present and recent numbers to articles dealing with the prominent difficulties of carbon printing, and furnishing that ounce of help which is proverbially better than a pound of advice. And we are happy to add that, in the majority of instances, we are furnished with examples of the successful working of our correspondents. Mr. A. Wellesley Turner, whose interesting communication appears on another page, sends us some admirable specimens in the form of cabinet portraits.

The recognition of the importance of carbon which found expression in the recent discussion at the Society naturally excited hope amongst the legion of workers eagerly anxious for hints; but, unfortunately, the dis-

cussion did not issue in much practical information; and many correspondents have written complaining that it resulted in much confident affirmation, but in little more. And some correspondents protest against the implications of incapacity amongst photographers as the chief causes of failure. One angry correspondent writes:—"When Mr. Jabez Hughes speaks of failure being more the result of bad manipulation than bad tissue, he may fairly be credited as speaking for himself; but he has no right to fling such a charge against the hundreds of capable men who have for years struggled with the process." To this correspondent, and others expressing similar views, we may remark that Mr. Hughes said he spoke for himself, and we may call their attention that he also said he spoke these things for consolation to others who were struggling. And surely it should be a consolation and encouragement to know that the experience gained in struggle will end in success. Encouraging words are certainly valuable. Baily, the author of "Festus," has well said, "Men may o'erget delusion, not despair." It is important, on the other hand, to know that there are real difficulties to be overcome in working carbon successfully, and that the most successful still meet those difficulties, but meet them with fresh effort. "If your sword is too short, add a step to it," was the advice given to the Spartan youth. Good carbon work is worth effort, and photographers may be assured that the process must come into general use. Our remarks at present are chiefly introductory to some observations by a gentleman of our staff, who has had many years' experience in connection with carbon printing, who feels it important to speak his mind on the subject at the present moment, on both sides of the question. We need not comment upon his remarks, beyond observing that the practical history of carbon printing began with the publication of Swan's process, and is really much shorter than he assumes. And we may add that to us it seems that to an entire novice carbon printing would not present more, probably less, difficulty after the first lesson than silver printing. Our contributor shall now speak for himself:—

"In the discussions upon carbon printing at the last meeting of the Photographic Society, as in the case of most deliberations upon the subject that have lately taken place, two points were boldly advanced, and were apparently undisputed. The first is, that whatever failures carbon printers may experience, it is never the material that is at fault; and, secondly, that printing in permanent pigments is, in point of difficulty, no worse than the albumenized paper process, which was just as long in coming to maturity. These assertions have been so often repeated that they will one of these days be taken for axioms, and, for fear such should be the case, I think it worth while to utter a feeble protest against any such absurdities. To come to matters of history, it may safely be asserted that printing with bichromate has been known quite as long as, nay, longer than, printing upon albumenized paper. No doubt, while Poitevin, Fargier, and others were occupied in their first attempts at printing with the help of pigments mixed with gelatine, albumenized paper was rapidly coming into general use; and while Laborde, Blair, and Swan were still struggling to produce satisfactory impressions in carbon, albumenized paper had long since attained perfection. But what does this prove? Simply, that the albumenized paper process is a far simpler method than carbon. 'Consider for a moment how long it was before albumenized paper came to perfection,' say the advocates of carbon; 'remember the long years that elapsed before we secured a tone to our satisfaction, and a surface free from reproach.' All this is very well, but I cannot admit that it proves anything. As I say, printing with bichromate was known before albumenized paper, and if one process was not more difficult than another, how is it that printing by the aid of gelatine has been so long in abeyance? It was certainly not for want of workers. The most intelligent

and learned experimenters have taken part in the elaboration of the carbon process, and if it had not been so we should not be where we are at the present moment. But, after all, have we really been all these years bringing the albumenized process to its present state of perfection? I trow not. On the contrary, I could name well nigh a score of photographers who protest that the albumenized prints of twelve or fifteen years ago are better than those produced to-day—that they are more permanent, and of a better tone. What has been done of late has not been to improve the albumenized paper process, but to rather injure it. The complaints which have been published in these columns fully testify to this fact, and photographers, as they know very well, must use a good deal of discretion now-a-days in the purchase of their albumenized paper, especially if they go to a foreign market for their wares. No, the albumenized paper process has not been all these years coming to perfection; it was known but a very short time before the difficulties connected with it were got over, and photographers, I assert, who print to-day upon albumenized paper are no better off than they were fifteen years ago. If, on the other hand, it is not the albumenized paper, but the manipulations connected with it, that are meant by those who say that one process has quite as many difficulties connected with it as the other, then I join issue again. Give a man, totally ignorant of photography, a negative, together with a sheet of albumenized paper, and some tissue, with a memorandum pinned to each describing the various manipulations, and ask him to produce a print as soon as possible by both processes. Can any one doubt for a moment that he would secure a better picture with the albumenized paper than with the carbon tissue? A novice, as everybody knows, after a few simple instructions, is in a position to produce a whole batch of albumenized prints—carte-de-visite portraits, or landscapes. Would he, however, be able to do such a thing with carbon, having the same amount of instruction? Why, we are told by men who have been photographers all their lives, that they have been to the fountain-head for instruction, and yet they fail in producing good carbon pictures continuously. Again, as to the first point, the immaculate character of the materials with which carbon printers are supplied. Is it so very certain, after all, that these cannot be improved upon, and that they must inevitably produce pictures if only properly handled? This is not my opinion, at any rate, however it may satisfy others. To my thinking, there is a great deal yet to be done in improving carbon tissue and transfer paper, and it is surprising to me how clever photographers—who have conscientiously worked at printing in permanent pigments, not for a month or two, but for years—can tacitly sit by and be told that, whatever may be the cause of their failures, the materials with which they work must be exonerated from all blame. It is permitted to criticise the quality of albumenized paper. Why, then, should the materials connected with carbon be declared sacred and *sans reproche*? My experience of carbon printing—and I say so without the slightest reserve—has taught me that there is good tissue and bad tissue, good transfer paper and bad transfer paper; and I should as soon think of believing in the universal excellence of carbon materials as in my own fitness always to produce good photographs. And now, having said so much, and reminded my brethren that there is another occupant of the stable as fit to carry a saddle as themselves, let me bear every testimony to the good faith and perseverance of the gentlemen of the Autotype Company, and of all those who have made the tissue what it is. If the materials that are produced are, as I have said, not immaculate, they are, I fully believe, as good and as uniform in quality as it is possible to produce them. Let photographers try and try again, for it has been demonstrated over and over again that the finest work and the most delicate of productions, which are permanent to a degree, may be prepared

from the materials as they are now to be had in commerce. The Autotype Company has worked hard and perseveringly for many years; it has called in the aid of scientific and technical men of great experience, and the stage of perfection that has now been reached is but a just reward for their enterprise. I exhort photographers throughout the length and breadth of the land to engage in carbon printing, and if they do not succeed at first, it is five chances out of six that it is their own inexperience, and little else, that is at fault. At the same time I repeat that it is quite possible faults may lie in the materials themselves, and herein may chance to be the source of their troubles. The carbon process is a difficult method of printing at best, and carbon materials are also difficult of preparation. We are rapidly improving both in the one and the other, but we have not yet arrived at perfection in either respect. Carbon pictures are now produced quite as charming in every particular as silver prints, and every day, too, in large quantities. But it were idle to deny that it is not a process requiring particular care and skill in all its details, if pictures of uniform excellence are to be obtained with it.

RAPID EXPOSURES.

THE *Arctic* publishes a communication from Mr. Conrad Petersen, now resident at Fayeth County, Texas, in reference to rapid exposures.

A silver bath to sensitize plates, requiring but a third the usual exposure, may be prepared, says Mr. Petersen, as under:

Nitrate of silver ...	...	...	8 ounces
Iodide of potassium ...	...	...	40 grains
Nitrate of baryta ...	...	...	288 "
Pure distilled water ...	...	...	96 ounces

The bath is filtered, and a little nitric acid is added to make it work clear.

The collodion employed is made from "Anthony's snowy cotton" washed in water containing a few drops of ammonia; it is rinsed afterwards in pure water, pressed in a cloth, and allowed to dry in the sun, so that no trace of ammonia remains behind. To each ounce of ether and alcohol mixture I take five grains of this pyroxiline.

The iodizing solution for an ounce of normal collodion is prepared of:

Iodide of ammonium ...	...	...	3 grains
Bromide of cadmium ...	...	...	1½ "
Iodide of cadmium ...	...	...	2 "
Bromide of potassium ...	...	...	1½ "

These salts are rubbed down in a dry mortar and dissolved in alcohol. The developer is composed of:

Double sulphate of iron ammonium	...	...	3½ ounces
White sugar ...	...	...	420 grains
Glacial acetic acid ...	...	...	1½ "
Rain water ...	...	...	10 ounces

Before use there is mixed with every three ounces of this developer twelve ounces of rain water and one ounce glacial acetic acid.

CARBON PRINTING.

BY A. WELLESLEY TURNER.

THIS subject cannot but be of great interest to the profession, and although so much has been written and said on the subject that, to the few, if any, who take no interest in a matter so important, the very title of my article would be voted a bore, still there seems to be a want of knowledge among many photographers of the progress carbon printing has been making, and more particularly why it has not advanced in greater strides. The constant mention of this subject in the journals, and the anxiety for information shown by the profession, proved

beyond doubt that the craving for a permanent process of printing is still as great as ever; and yet the general tone of the speakers at the meeting of the British Photographic Society, held specially for the consideration of this subject, seemed in my opinion to lack that character that should mark a really commercial process. If, then, this method of photographic printing is so perfect as we are so often told, and the interest in it so great, how is it that it is not more generally used? This question must necessarily suggest itself to every thinking photographer who has not yet commenced working it, and consequently throw some doubt on its genuineness. We all know that to make anything popular requires two classes of workers. The first must be energetic and scientific men, to clear and pave the way to the desired end; and when this object is attained, it is only natural that the second class will follow and share the advantages gained by the first, it being their share of the labour to make the process more popular and general. Of the former class I consider we have had our full share giving their time and skill, as well as expending vast sums on carbon printing; but to bring it before the public, it is the second class of men that is required. Why this is so, then, is the object of my present article, and I consider I have studied the process under circumstances that give me special experience to speak on this particular branch of the subject.

Many, I feel fully aware, will say that the progress has been great in carbon printing, and that all good things, before they take a strong hold on the public, require a long time to properly mature. In answer to this I feel justified in saying, that seeing the lack of information on this subject disclosed to any casual reader of the journals, carbon printing has not made anything like the progress it should have done; and, in the second place, that it has had a very long probation, and been brought before the profession more often and with much greater inducements than any other process in photography. For years we have had it placed most temptingly before us, and yet how few have adopted it as a commercial thing! Many, on the other hand, may say that there must be some insurmountable difficulty in the process that renders it thoroughly uncommercial. To these I can give a plain unvarnished negative: I have been working the carbon process four or five years, at first principally in large work, but latterly for carte and cabinet work, and as I think there can be no doubt as to the suitability of carbon for large work, I will now confine my remarks to the latter branch. For over twelve months I have paid almost exclusive attention to the enamelled prints often called chromotypes, and during that time, winter and summer, I can honestly say that I have met with no absolute difficulty that any skilled printer might not easily overcome.

I will not go so far as to say that this process is cheaper and easier than silver printing, as I feel sure that no one who has practised it can, without prejudice, affirm; in fact, I believe that to exaggerated statements of this class we owe much of the failure we have heard of, and this, together with the fact that carbon printing has such a strong antagonist as silver printing to fight against, is what will best answer the question, Why has not carbon printing made greater strides? Those writers who so triumphantly proclaimed the great advent of carbon to the extermination of silver did not reckon the power of the foe they so assuredly prophesied the overthrow of, for had they a moment considered the qualities of the two processes side by side, as I purpose doing, they would have come to the conclusion that silver printing has too many advantages in the balance for carbon printing, even with the weighty advantage of permanence, to turn the scale in its favour. This is the greatest stumbling-block to carbon, viz., that silver printing so nearly fulfils all the qualities required by the photographer, even with permanence, to a great degree, if carefully worked; and from this fact I maintain that it

is not any physical defect in the process that has retarded the progress of an otherwise invaluable method of printing.

Let us now, without prejudice, consider the two parties face to face, and see which presents the most favourable aspect by the comparison to the generality of the photographic profession.

Taking a perfect silver print on ordinary albumenized paper, and an equally good enamelled carbon, I think the weight of qualities, as far as artistic appearance goes, would be equally divided; some, I am aware, prefer the splendid surface of the carbon, whilst others would consider the plain albumenized print more artistic. But as opinion on this subject is so various, I think we might give equal palm to each; both carbon and silver bring out the delicate detail of the negative to a wonderful perfection, although in the case of some class of negatives I would give preference to the former process; and I am of opinion, also, that the enamelling of the carbon print brings up the deep shadows with more brilliancy; but we must remember that silver prints can also be enamelled, although so seldom done, and, therefore, any qualities brought up in the carbon by this means should not be allowed much weight. So far, then, as mere appearances go, we must leave to individual judgment and public taste.

We next come to the physical qualities of both processes, and in this respect I think we can safely give the verdict in favour of carbon. It is undoubtedly permanent if fugitive colours are not used in the preparation of the tissue, whilst we all know that the longest life we can guarantee to the most carefully-worked silver print is not more than fifteen or twenty years. This is the most important, and, I may say, only point entirely in favour of carbon, and the one that will ultimately turn the balance, if anything will. As there can be no doubt on this branch of the question, I think it unnecessary to say more.

We now come to the plea most in favour of silver, viz., ease and cheapness of production. Without going into actual figures, I can say, from a considerable experience on both sides, that silver printing is much cheaper, reckoning the actual cost of production, by a long way, and requires less labour of a skilled character to produce. As far as certainty of results go, this at present is in favour, also, of silver; but this is caused principally by a want of more experienced printers in the new process, as many workers have affirmed. I have no doubt that when carbon printing is more generally worked, it will produce an equal quantity of good results, at, of course, greater outlay in materials and labour; but this difficulty can be overcome by charging a higher price for the production, in which direction at present there is plenty of room in photography. We can now see how it is that the older process still retains its place in the studios of most photographers. How tempting it is, when a young beginner in carbon finds things working wrong, wasting both time and materials, as well as temper, over one process, whilst another method is within call that he has been using for years, and with which he is so well acquainted, knowing at the same time that it pays better, and pleases his patrons for the time, at least, as well! Why, then, he argues, should he trouble himself? and so he either puts it aside till a more fitting time, which may be long in coming, or discards the process entirely, and begins, like the fox and the grapes, to persuade himself that silver printing is quite permanent enough. This, it may be remarked, is rather a blue look-out for the new comer. What are we to do with carbon printing? Are we to discard it entirely for small work, or to practise it at a loss? Certainly not, I would say; it is too good and practicable for the first fate, and it would be absurd to think of working it on the second condition; besides this, it is a thing both photographers and the public require.

We have long been striving after a process with beauty and permanence combined, and here it is, though still, for

the reasons I have stated, not received with the welcome it deserves. What is required, then, is that the profession should properly understand how carbon stands, or, if I may use the expression, its social position in the society of processes. This has been my object in the present article more than technical information, which any photographer may easily obtain either by visiting the Autotype Company, or by obtaining its Manual, and for himself practising the process first on a small scale till he has thoroughly mastered its difficulties, and afterwards commercially. If every photographer would do this—and it would cost but little to begin with—we should see carbon prints in every studio, and consequently the public would become acquainted with the process, and better able to understand its qualities; it would be more prominently brought before their attention, and chromotypes or carbons would become as much a household word and necessity as cartes and cabinets are now. As it is at present, the public only see a few here and there distributed over the country, and look upon them as of no importance. I have myself heard many of our patrons remark, when they are introduced to their notice, something to this effect: "Oh, yes; they are those glazed things they are so fond of on the Continent!" and they evidently imagine that they are only the ordinary style of things enamelled or varnished up. Of course you remind them of their permanence, but this, in nine cases out of ten, they have been told a dozen times before of other processes which they have gazed on, till they gradually lose their bloom, and consequently they only place such remarks in the same category that they would if any tradesman told them that his particular wares were so much better than those kept by the gentleman on the other side of the street. They therefore often shrug their shoulders, and pay very little attention to the boasted permanence, as it cannot be proved on the spot. If, on the other hand, every photographer had permanent photographs in his studio, the public would see that the profession had more confidence in the process, and think that the thing was therefore more genuine; and this is what we really require to make the process the thorough success it deserves.

After advocating the more general use of carbon, it would only be right for me to offer to give any assistance I can in the technical difficulties of the process, which I shall be happy to do at a future time.

(To be continued.)

CARBON PRINTING.

BY GEORGE CROUGHTON.

DOUBTLESS many besides myself have been disappointed at the result of the discussion upon carbon printing, for it cannot be disputed that although there has been a deal of talk, there has been little or no practical information upon the subject.

The discussion at the Photographic Society of Great Britain was both satisfactory and unsatisfactory. It is eminently satisfactory to hear that Mr. Hughes has returned to carbon printing after deserting it, but it is very unsatisfactory not to know the cause of such desertion. It is interesting to know that Mr. Hughes' temporary return to silver printing has only tended to disgust him with it, but it would have been more interesting and instructive to have heard what were the troubles which forced him to such temporary return to silver printing. It could have been no slight trouble which would cause such an indefatigable worker as Mr. Hughes to give up carbon even for a short time, after telling the photographic world that he had banished silver printing altogether from his studio, and which sent him to the four corners of Great Britain in search of information upon the subject; and it would no doubt have been worth a great deal to have known the evil, and its remedy. But of course Mr. Hughes has a perfect right to keep the know-

ledge acquired at the expense of so much time and trouble, and he must have regarded the discussion meeting somewhat in the light of a trap to catch information. Mr. Fry, who opened the discussion, left the subject much in the same position as when he took it up, and for practical information you may almost say the same for all the speakers except Mr. Sawyer, who gave a most valuable explanation of that bugbear of carbon printers—reticulation: this alone would be sufficient to redeem the discussion from utter failure as far as practical details are concerned. Nor has the discussion in the pages of the *News* fared much better. We have had an experimentalist asking for information, and getting a setting down by a successful worker. Now although, to a certain extent, a successful worker also, and, like him, a licensee of the Autotype Company, I have, like "Experimentalist," been looking for some of the great successful workers—those who have been so successful as to be able to banish silver printing altogether—to give us their experience, that we might all know the secret of their great success; but, alas! the time for free interchange of thought and experience is over; every one holds fast what he gets, and "Experimentalist" has to ask in vain; so for want of a better, and in the hope that my experience and difficulties may tempt others better qualified to speak, I will just step into the gap, premising that on and off I have worked carbon for the last seven years for large work, and as a basis for colouring, &c., but only of late have I tried it for small work, such as carte or cabinet portraits, and although successful to a certain extent as an experimentalist, I cannot boast of being so successful as to be able to banish silver printing, or even to put it in the least aside for the usual carte or cabinet work. But, as I believe the days of silver printing are numbered, and that it is sound policy to keep pace with the times, I think it is well to be ready for the change when it does come. There is always the satisfaction of knowing that carbon prints will repay the trouble of their production in respect to their permanency.

"A Successful Worker" says that "Experimentalist," and all like him, should go to the Company and pay their fees like men, and get proper instruction. Just so say I; for there is nothing like seeing a thing done, for far more can be learned by one hour's personal instruction than by twenty hours' reading. But it is one thing to see a clever manipulator go through all the various processes, with materials in proper condition, and every appliance in perfect order; and quite another to come home and try to do the same thing off hand. You are totally unacquainted with your materials, you omit some little detail to which you attached no importance, and then in step the troubles, and hints from successful workers are desired. I have found the Autotype Company always ready and willing to answer enquiries as to difficulties, &c.; but in the hope of assisting some beginner, and of inducing some successful worker to follow, I will give my experience without further preface.

Well do I remember my first trouble with the tissue. I was using the double transfer process, developing upon grained zinc plates. This one simple thing caused me great trouble and anxiety. We were just giving up silver for carbon as a basis for coloured and finished work, and several evenings before leaving the studio I had hung up to dry some six or eight sheets of various sizes for use in the morning; but time after time they were found perfectly useless, being quite insoluble in the hottest water. After this had happened four or five times, I took some of the much-abused tissue home with me, and sensitized and dried it at home, bringing it to the studio with me in the morning. This worked all right, so I made strict enquiries among the boys, and found that the first thing in the morning the printer's assistant, whose duty it was to wash out the dish and put the silver to filter, did this with the *dark room window open*, and as my pieces of carbon were hanging just in front of it there was a sufficient explanation of its insolubility. My next trouble arose out of this incident.

I cautioned the lad not to have the window open, and explained to him that the pieces of patent leather were more sensitive to light than sensitized albumenized paper. The next morning, when I went to take down my carbon, I found my paper hanging, but the carbon was upon the floor. The lad, thinking to get the stuff out of the way, had lighted the stove as soon as I had gone, and got up such a heat that the tissue slipped off the paper. These troubles you will say were simple enough, but they arose from the same cause as Mr. Hughes tells us his troubles came from, viz., imperfect acquaintance with the materials.

Coming to later times I can see (in the light thrown upon the subject by Mr. Sawyer) that most of my troubles have had for their cause the hurried drying of the tissue, and in contrast to most carbon workers I have been more troubled in the cold weather than in the hot, and this is easily explained. In the summer I have allowed the tissue to dry spontaneously, and success followed; in the cold weather heat was used, and I overdid it, and dried too quickly, causing reticulation and granulation. Another cause of reticulation will be found, I think, in too short an immersion in the cold water before putting down upon the support. This will not show if the tissue is developed upon paper direct by the single transfer process, or upon the temporary support; but it will at once upon the collodion. It can be explained, I think, in this way: by putting the tissue upon a rigid surface before it has expanded as much as it will, the reticulation is caused by its expansion after being attached to its rigid support; but for the sake of young experimentalists I will go over each detail of the manipulations separately, knowing that the importance of the subject will be sufficient excuse if I repeat what has been written before.

(To be Continued.)

THE AMERICAN COMPETITIVE EXHIBITION OF PERMANENT PHOTOGRAPHS PRODUCED BY THE CARBON AND LAMBERTYPE PROCESSES.

THE above competitive exhibition, of which comparatively short notice had been given, took place on the 11th of January.

There were fifty exhibitors from various parts of the United States and Canada, and some pictures made by European artists were also shown. Col. Stuart Wortley had sent some from England, but although they had arrived in this port, they could not be got through the Custom House in time to be placed on exhibition. M. Liebert, of Paris, had proposed to send his Centennial display, but in consequence of the high charge for U.S. duties they were returned to France. The whole number of productions by the various processes was three hundred and fifty-five, and it may be fairly said that there were none that were not equally as good as silver prints could have been made by the same persons, while the larger quantity were far superior, in our opinion, to any that could be made by silver from the same negatives.

We were quite pleased, if not surprised, by the large number of exhibitors and the prevailing excellence of the work. Besides the exhibits for which medals have been awarded—and several arrived too late for competition—were some very excellent productions by the Lambertype processes from Messrs. Dimmers, of New York; Wykes, Quincy, Ill.; Wallin, Fort Wayne, Ind.; Milnes, Hamilton, Can.; Vail, Geneva, N.Y.; Poole, St. Catherine's, Can.; Saunders, Alfred Center, N.Y.; Allen, Pottsville, Pa.; Potter, Warren, O.; Klauber, Louisville, Ky.; Brooks, Dundee, Can.; Smith, St. Alban's, Vt.; Roth, New Orleans, La.; Higgins, Bath, Me.; Sherman, Elgin, Ill.; Ross, Syracuse, N.Y.; Holton, of Boston, Mass., and others.

The gentlemen who kindly acted as judges, and who are all proficient in photography, have unanimously testified to the practical excellence of the modes of working.—*Anthony's Bulletin.*

Correspondence

NOTES ON CARBON.

SIR,—Mr. Jo. Vestris' letter under the above heading is quite to the point, and he says exactly what I should always have refrained from expressing, not wishing to incur uncharitable rebukes which might have been to the effect that interested motives prompted me in making the suggestions, because I happen to have secured exclusive rights for several other towns besides my own, and wished to dispose of the licenses. I would not occupy your space even now, were it not that I am in a position to answer the question "How are we to help the photographers of Edinburgh?" They require no help at all in the matter; if they wish to help themselves, they have only to call upon Mr. Ayton, who is quite willing to dispose of sub-licenses to them at the ordinary price. This being correct information received from Mr. Ayton himself, I think it will show that the want or absence of improvement in that direction is not due to the selfishness of any member of the profession who has been enterprising enough to lead the way.

As it is very desirable that no misconception should exist on this point, I may be permitted to remark that I am placed in the same position. I have never refused to treat with other members of the profession on what it is agreed to consider "equitable terms"; but I must say that very little desire has been shown to adopt the processes of Mons. Lambert, even after it has been satisfactorily shown that they are workable, and can be made to produce superior results. To what cause or influence this may be attributed I care not to enquire. Suffice it to state that many problems had to be solved by the licensees after they were left to themselves, and it is gratifying to know that in the face of many drawbacks complete success has been achieved in many quarters.

One word more, and "I expire," as our trans-Atlantic friends say in their "real live journals." From the first a sort of tacit fraternal understanding has existed among the chromotypers, and the more successful ones have never refused information and assistance of every kind to those who applied for any. It has often been given at considerable personal trouble, and received very few thanks; but that need not surprise any one who has lived long enough in this world.—Truly yours, C. FERRANTI.

THE PHOTOGRAPHIC SOCIETY CARBON DISCUSSION.—"PICKING UP" THE PROCESS.

SIR,—The so-called carbon discussion seemed to be "much cry and little wool." All that took part in it sang a psalm of praise to its glory; but for real practical hints there were none. True, Mr. J. Hughes hinted at difficulties—great ones—but did not explain what they were, or how he overcame them. This is not like the Mr. Hughes of old, who ran a difficulty to earth, and then told us all about it. Now, I have "picked up" the carbon process, and am desirous of issuing all my work by it; but I do not feel justified in advertising to do so with the possibility of, perhaps, bye-and-bye being brought to a dead lock. Mr. Hughes and others may say—and, in fact, do practically say—"We paid for our learning: you do the same." I venture to hint, with all due deference to those gentlemen, that it is not the spirit of the photographers of old, nor in the spirit that has made photography what it is; and it must have a tendency to retard progress in what all of them are professing to desire, namely, permanent photography.

Now, as to "picking up" the carbon process, we all know that the Lambertype is a patented process, and we must pay a fee for its use, and I think it is generally acknowledged that it is quite a justifiable patent, and a reasonable fee; but, on the other hand, the Autotype Company are urging photographers to print in carbon, and the ordinary double and single transfer is quite free to all that choose to use it. I advise intending Lambertype licensees to learn and

perfect themselves in the ordinary process before going in for the other.

If those anxious to learn will purchase the last edition of the "Autotype Manual," and carefully follow instructions, they will be able to produce carbon prints by the ordinary double transfer quite equal to silver. It is recommended to finish by polishing with the waxing compound. I use plain collodion after the prints are spotted, rolled, &c., and, when dry, roll again. There are no special dishes required unless you like, and the Autotype Company supply them if wanted. Neither are special printing frames required (see a hint by Mr. G. Croughton in *YEAR-BOOK*, page 89, on that subject); but do not use albumenized paper for transfer—it will fade. The Company will supply the tissue in small or large quantities ready sensitized. Photo-purple is good. Auto-brown I prefer for small work. You can also get very good transparencies for enlarging by using the engraving-black; coating a plate with collodion, washing it, and, while still wet, developing your picture on it. If not deep enough, dye it with Judson's dyes. Crimson-lake I find answer, giving a nice bloom to the transparency. By getting the tissue ready sensitive you escape one of the greatest troubles. Do not buy too much at once, as after a time it becomes insoluble. Do not be in a hurry, and do not suppose you are going to succeed to perfection the first time of trying because you "know all about photography, you know." Go about it in a proper way, and you will like it. It is a charming process, and quite a change from hum-drum silver. Trusting these few hints will be useful, and that all anxious to learn will try carbon, and give us some of their experience in return, I am yours, &c.,

ONE THAT HAS PICKED IT UP.

FADED LIGHTDRUCK PRINTS.

DEAR SIR,—My attention was directed at a very early stage of my work to the fading of prints produced in the press. It was my custom to use the best colours, such as are employed in fine litho work, but to my horror I found that an exposure to sunlight of even a few hours was sufficient to perceptibly change the colour of the print, whilst a few days' exposure to ordinary daylight was sufficient to eliminate almost every trace of colour, leaving, of course, the black unchanged.

After much trouble, and a good deal of hard work, I at last succeeded in preparing pigments which would work kindly on the press, give all the transparency that the lakes afford, and be of an absolutely permanent character.

Still it is just the same with this as with the pigmented gelatine, a picture in either of them cannot be permanent if fugitive pigments enter into the composition.

May I beg you to accept a few prints? They are part of a series of 800 plates for a great work *Les Travaux publics de France*, now being published by M. Rothschild by authority of one of the Ministers of State; and it says something for the progress of the art in England, that we should have been able to compete successfully for the production of this work, against the many able workers on the Continent.

The proofs are from reproduced negatives, are on toned thin paper, and are sent in this state to be mounted with handsome border and title in Paris.—Believe me yours very truly,

J. R. SAWYER.

Ealing Dene, Feb. 7th.

[The prints enclosed are excellent, and practically indistinguishable from good silver prints on albumenized paper.—ED.]

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the South London Photographic Society was held in the Society of Arts Rooms, on the 1st inst., Rev. F. F. STATHAM, M.A., F.R.S., President, in the chair.

After the reading of the minutes of the previous meeting, Messrs. A. Harman and Bolas were elected members.

Mr. WILLIAM BROOKS then read a paper "On Transparencies by the Emulsion Process" (see page 61), and submitted a number of pictures for exhibition.

The CHAIRMAN, in thanking Mr. Brooks for his paper, contrasted his generosity in publishing so freely the details of his process with the reticence of others who had experimented with emulsions.

Mr. J. T. TAYLOR could scarcely agree with the Chairman; for, in his estimation, experimentalists in the collodion emulsion process had very freely given to the world the results of their investigations. He considered that the decline of stereoscopic photography was more owing to the want of a convenient form of stereoscope than, as attributed by Mr. Brooks, to deficiencies in stereoscopic slides.

M. LEON WARMERKE found that a variety of tones in an emulsion picture could be produced by giving it a long or short exposure. A long exposure usually gave warm tones.

Mr. SPENCER said that in point of expedition in producing a transparency for use in enlarging the emulsion process certainly possessed advantages over the carbon process.

Mr. TAYLOR having observed that by giving an edging of tallow to an emulsion plate the necessity for a substratum of albumen was done away with,

Mr. MAWDSLEY said that this application of tallow to the margin of the surface proved highly beneficial, and he could strongly recommend it.

Mr. NESBITT exhibited a number of transparencies taken by collodion emulsion prepared by himself. He observed that the process was a very fascinating one. In making emulsion he preferred a slight excess of bromide.

Mr. HENRY had been very successful with emulsion work, and trusted that the numerous fine specimens that had been exhibited that evening would prove an incentive to others to try the process.

Mr. FRANK HOWARD was gratified to find that the difficult question of obtaining a pleasing tone had been so successfully met by Mr. Brooks.

Mr. YORK did not consider it possible to obtain such a good tone by means of camera printing as by superposition, nor did he see that any advantage was to be gained, in respect of rapidity, by adopting the method advocated by Mr. Brooks.

A conversational discussion here ensued on the effects produced on the tone of the transparency by the duration or shortening of the exposure in the camera, in which Mr. Foxlee, Mr. Beasley, and others took part.

Mr. BROOKS having replied, a number of transparencies were exhibited by the magic lantern, after which the meeting separated.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management held their monthly meeting at the Offices, 174, Fleet Street, on Thursday evening, February 1st.

After the dispatch of the ordinary routine business, Mr. E. Lavender was admitted a member of the Association.

The Sub-Committee then presented a petition for assistance which they had thoroughly investigated, recommending it as a most needy case. Upon motion, the sum of £5 was voted to relieve immediate distress, and steps taken to procure employment for applicant.

Some of the members then dwelt on the desirability of making better known the advantages of the Association to its members (members' applications for assistance only being entertained); the subscriptions being fixed at such a rate that all persons engaged in the various branches of photography are enabled to support it.

There being no further business, the meeting adjourned till Thursday, March 1st, at 8 p.m.

Talk in the Studio.

SEAVEY'S BACKGROUNDS.—Mr. J. J. Atkinson, of Manchester Street, Liverpool, writes to us as follows:—"In the PHOTOGRAPHIC NEWS, February 2nd, I see, in reply to correspondent 'W. W. W.,' you speak of Mr. Seavey as a professional background producer, living in New York; and you refer to the need of good background artists, generally, in connection with photography. Holding this view myself, and having a very

favourable account of Seavey's work, I sent an order to him for a sample of half a dozen of his best backgrounds, and have just received them." Photographers generally are familiar with Mr. Atkinson's enterprise in connection with American photographic specialties, and many will be glad to learn that they may obtain the backgrounds in question. Communication direct with Mr. Atkinson will, doubtless, bring all the detailed information required.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The Annual Meeting of this Society will be held on Tuesday next, February 13th, at 5A, Pall Mall East, when the Report of the Council, and other business, including the election of officers, will be transacted; after which Mr. H. Baden Pritchard, F.C.S., will read a paper on "Photography from a Holiday-Maker's Point of View."

THE SEA INVADING STUDIOS.—A correspondent at Blackpool says:—"It seldom happens that photographers suffer from the inroads of the sea. Hence, it may interest some of your readers to have recorded some of the doings of Neptune at Blackpool. On Tuesday last the place was visited by a strong S.W. gale, which brought a heavy sea over the promenade, causing a great destruction of property. Photographers came in for their share of damage. At the extreme north Messrs. Wolstenholme's studio was slightly injured; going south, Mr. Wright's studio had the roof blown off, the lights broken, an end blown down—indeed, almost wrecked. Mr. Ward comes next, the studio floor being damaged, and about thirty feet of a nine-inch wall knocked down. Mr. G. S. Haigh follows, the sea making a clean breach through, breaking in the shop front, and sweeping the full length of the studio. The wooden studio of Mr. Isaac Wilde was entirely wrecked—not a particle left standing. Mr. Harrison's studio (yet farther south) was seriously injured, the front broken in, and the sea rushing through. The loss must be very serious, and is a matter for regret." A disaster even more serious occurred a few weeks ago at Margate, as we learn from a letter in the *Daily Telegraph*. The writer says:—"Amongst the many thousands of visitors who throng the cliffs of Margate during the season I doubt if there is one who is unfamiliar with 'Bijou.' His photographic studio stands within a stone's throw of the Cliftonville Hotel, and for many years has been adorned with spirited sketches of no ordinary talent. But storms and tempests have no regard for art, and on the first day of the new year 'Bijou's' studio was destroyed by a sudden gust of wind. Certainly the damage done in this case is very small compared with the severe losses in other parts of the country, but it must be remembered that this studio represented the only means 'Bijou' possessed of providing for a wife and several young children, and now this is gone he has made an appeal to the public to help him to repair his loss. May I ask you to give publicity to this case, as I feel sure your readers would gladly send a trifle to make up the small sum needed (I imagine less than £100 is required) to re-instate 'Bijou' in his studio. From an advertisement that has recently appeared, I observe that donations will be received at the Margate Bank; but if any visitor to this town feels able only to contribute a sum too small to send to a bank, it will be gratefully acknowledged if addressed to me at Dixon's Library, Margate.—I remain, sir, yours truly, D. S. 14."

M. LAMBERT IN AMERICA.—The American journals teem with correspondence on the carbon question. The enthusiastic licensees of M. Lambert are unmeasured in their expressions of praise. The *Philadelphia Photographer* is in antagonism with M. Lambert, and this has stimulated his licensees to much plain speaking. Mr. Theo. Lillianthal, of New Orleans, says:—"Since I became familiar with M. Lambert's processes, I have met with no more failures than by the silver processes, and could, and would willingly, abandon the last if my charges for carbon work were not higher." Many other letters are to a similar effect. The Competitive Exhibition passed off successfully, bringing together a large mass of fine carbon printing.

INTENSE LIGHT FOR TAKING PHOTOGRAPHS.—A very brilliant, perfectly white, and very actinic light, which may be used for taking photographs, is produced as follows:—Place some perfectly dry, powdered nitre in a suitable clay vessel, and in a cavity made in the middle of the powder place a piece of phosphorus and ignite it. While it burns, the nitre melts and a quantity of oxygen gas is given off, producing an intense light.—*Scientific American*.

To Correspondents.

CONSTANT READER.—The fault in the lower part of your portraits, imperfect illumination and imperfect definition, is due to various causes; but chiefly to the imperfection in the lens, which does not cover sufficiently well, and has not a sufficiently flat field. For standing card-portraits, a lens especially manufactured for such work is desirable to secure the best results. If you use a smaller stop, and take care that the lower part of the figure is better lighted, you may, however, secure better results. A lean-to roof is generally better for a small studio than a span roof; and we should prefer it with a studio ten feet wide.

J. L.—The spots appear, undoubtedly, to be due to metallic particles, which reduce the silver at the point. They are similar to those produced by particles of iron in the paper; but they may proceed from other causes; such, for instance, as particles of metallic dust coming in contact with the paper. Such dust may arise from various causes; such, for instance, as the grinding of the hinges of the back-board of the printing frame, or of a box where the paper is kept. If the fault is not in the paper, extreme cleanliness and care in the room where the paper is kept, or silvered, or dried, will best aid you.

SMOKER.—The best stove which we know for the studio or operating room is George's Gas Calorigen, which gives warmth and fresh air without risk of any injurious products escaping into the room.

A. WELLESLEY TURNER.—Many thanks. The cabinet prints are very fine indeed.

TYRO.—The front lens of a portrait combination may generally be used as a single landscape lens; but such a lens is not suitable for the back lens of the combination. But you may combine two single lenses, placing each with its convex surface outwards, and a stop between; the amount of separation being determined by experiment. You can scarcely hope, however, for a very good result, as the combining of lenses of suitable form and focus, to produce the best results, requires all the skill of an experienced optician. The position of the stop is fixed by the respective focus of each lens. If the lenses were of equal foci, the stop should be placed exactly midway between the two. If one of the lenses have a focus of twelve inches, and the other of eight inches, the stop should be placed two-thirds of the distance from the first, and, of course, one-third from the second. If the best results in combining lenses could be defined by a simple formula, the duty of the optician, and success in its application, would be more simple and common than it is.

HASSAN.—So far as our memory serves us, a good series of Egyptian views was published by Frith. A very fine series was produced by Francis Bedford, and more recently by Frank Good. The latter are, we believe, published by Mansell, of Percy Street, Rathbone Place.

J. ROBINSON (Salford).—We do not remember that we have seen any of the enlargements you mention, and cannot offer any opinion, therefore, on the value of the formulae.

A BAD MANIPULATOR.—Skill in manipulation can only be gained by practice and care. Your question, "What am I to do if I belong to the condemned class of bad manipulators?" is scarcely one we should be expected to answer. We might answer that you must suffer the penalty of non-success; but we prefer to suggest that if your skill be less, let your effort be greater. As a rule, skilful and successful men are willing to help their less skilful brethren, as the communications in our pages bear witness; but such aid should be asked and received as a favour, not demanded as a right. A tone of angry remonstrance is as unfair as it is impolitic, and is most likely to defeat its aim. Try again, not once, but repeatedly.

SOCIETY OF GREAT BRITAIN.—The annual meeting will be held next Tuesday. Your voting paper must reach the Secretary before the hour of meeting. You can only vote for those nominated. You might have nominated any one you chose: but the time is now past. We can give you no information as to a presentation print. Write to the Secretary.

F. ROW.—We are obliged to you for a sight of M. Kary's specimens. We are familiar with his claims as to the invention of a special system of lighting, which we described some time ago. We shall have something more to say on this subject in our next. We will return the specimens as you desire.

JO. VESTRIS sends us the following impromptu lines upon a photograph, written in church on hearing the clergyman speaking of the "dear ones departed":—

"Tis not when friends are near we prize them,
When we can hear them speak, and sing, and laugh;
But when, for ever to our presence lost,
We fondly gaze upon their photograph."

Several Correspondents in our next.

The Photographic News, February 16, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE PHOTO-CHEMICAL ACTION OF THE EYE.

A CHARMING discovery has recently been made—the result of researches by two German physiologists, in which photographers thus take the keenest interest. It is no less than that the retina of the eye possesses photographic sensitiveness, and that an image can be secured by its means just as readily as can be done by the aid of a camera and a sensitive collodion plate. Every object we look at, that is vividly lighted, impresses itself on our retina exactly in the same way as upon an ordinary sensitized film. The image photographed upon the retina may be secured and fixed like other photographs, and is in every sense of the same character as these. Such a discovery—as the authors of it point out—may lead to the supposition that there may be something, after all, in those stories of which we frequently hear, of images being visible in the eyes of persons after death, of the retina of murdered men, for instance, showing plainly the image of those who slew them; but, as our readers will find, if they have the patience to follow us, there would be, under any circumstances, little chance of such things being brought about. It appears that three months ago M. Boll, who now occupies the chair of physiology at Rome, discovered the remarkable fact that the external layer of the retina possesses in all living animals a purple colour. This purple surface, he found, bleached on exposure to light; but regained its pristine colour in the dark. Like pure iodide of silver, indeed, you could impress an image on it, and if put away in the dark, the image disappeared, and the substance was again ready to receive a second impression. As Professor Bunsen has pointed out, there are many substances besides iodide of silver in which this phenomenon may be observed; but to M. Boll is due the credit of having shown that we in our eyes possess living matter endowed with such powers. This purple, which is appropriately termed *seh-purpur* (see purple), M. Boll affirmed, vanishes for ever immediately after death; but subsequent experiments have shown that this is not the case, but that the delicate photographic film remains sensitive under some conditions four-and-twenty hours after dissolution. And now we leave M. Boll, who has brought to our knowledge the presence of a sensitive photographic tissue in the eye, and proceed to the still more interesting researches of his disciple, M. Kühne. The latter, who is Professor of Physiology at the University of Heidelberg, was at once struck with the marvellous discovery of Boll, and forthwith determined to push the investigation still further; and he it is who, in a communication last month to the *Centralblatt der Medicinischen Wissenschaften*, tells us the astounding news that he has been able to obtain actual photographic images upon the retina, corresponding with objects which had been looked at during life. No wonder some of us, after viewing some bright object, close our eyes and rub them, and for seconds afterwards see the object in our mind so plainly. If it is photographed upon our retina, we need in future feel no surprise on this score. Also, when we have sat through some bright entertainments, or walked through sun-lit streets for an hour or two, it is surely only natural, if the *seh-purpur* of our eyes has been somewhat bleached, and become, so to speak, insensitive, that we feel a relief in going into the shade or darkness in order that the colour in the retina may once more return to its normal condition. The first important results that Kühne obtained were, it appears, to the effect that the colouring matter did not disappear immediately after death; but if kept in a dark room, illumined by the mono-chromatic light of a sodium flame, it could be preserved for four-and-twenty hours. It can, however, only recover its normal condition when attached to the eye, or, in other words, one can only compare its functions with that of iodide of silver so long as the retina is complete and the purple matter remains in position,

a circumstance which was proved in a most conclusive manner by Kühne. An eye was extirpated, and in one part of it the purple retina was lifted. The colour of this flap rapidly bleached; but as soon as the flap was laid down again, so as to be once more in contact with the inner surface of the choroid, a complete restoration of the purple was the consequence. So that the eye carries with it a living substance which has the power of *resensitizing* the photographic film whenever such a process becomes necessary. It is only, Kühne points out, when the eye is exposed for a considerable time to the direct action of a vivid light that any bleaching or fading of the *seh-purpur* is actually perceptible; but when this is the case, there is, as we have said, an actual photograph produced on the retina which can be fixed and preserved. Such a photograph Kühne terms an *optogramme*, and he tells us exactly how he proceeded in order to secure one. It was necessary to have recourse to a long exposure, as may be anticipated, for as we ourselves know very well, under ordinary circumstances, an image ever so deeply impressed upon our retina never remains there many seconds. A rabbit seems to have been the unfortunate object fixed upon; and poor Bunny was made to fix one of its eyes upon an opening in a window-shutter; the aperture was thirty centimetres square, and the lens or eye of the rabbit was at a metre and a half distance. The head of the rabbit was covered with a dark cloth for five minutes, so that the *seh-purpur* might be as sensitive as possible; and then an exposure was given for three minutes, the light not being very bright at the time, however. Only one eye of the animal was employed, and as soon as the three minutes had expired, the head was instantly cut off, and the eye, having been extirpated in a dark room by the aid of yellow light, was opened, and, as soon as possible, plunged into a solution of alum. The second eye was also extirpated and exposed as the living eye had been for a similar period to the same object, and then it was treated with alum in the same way. After permitting this fixing operation (for it may be so termed) to go on for four-and-twenty hours, the retina, in both cases, was closely observed. The result, we are told, was a clear square image, with sharply defined edges upon a beautiful rose-coloured ground. The size of the images was somewhat greater than one square millimetre, and in the first eye it was somewhat roseate in hue, and less sharply defined than in the second, which was perfectly white. That we are not romancing in all that we have said, and that our readers may not doubt the important facts which have come to us from Rome and Heidelberg, we may mention that within the last few days Mr. Arthur Gamgee, of Manchester, has repeated most of Kühne's interesting experiments, and is able to confirm them in every particular. That photo-chemical processes take place in the retina is a matter, therefore, beyond all doubt, and photographers to a man cannot but feel deeply interested in the analogy here shown to exist between the eye and the camera he uses every day.

FRENCH CORRESPONDENCE.

MÉDAILLE D'HONNEUR TO M. JANSSEN—UNFAVOURABLE REPORT ON M. SCOTELLARY'S MODE OF LIGHTING—M. LACAN'S OWN EXPERIENCES OF VIOLET LIGHT IN STUDIOS—A NEW WASHING MACHINE—BOVIN'S METHOD OF TREATING LIGHT AND DARK CARBON PRINTS.

As the medals which the French Photographic Society offered for progress during the years 1875 and 1876 have not yet been awarded, they have been transformed into a special honour medal, which was offered to M. Janssen at the last monthly meeting of the Society, held on the 2nd February. We also have to announce, with much pleasure, that among the new officers just created on the role of the Legion of Honour, the eminent astronomer also finds a place.

At the same meeting of the French Photographic

Society, the commission charged with investigating the method of lighting proposed by M. Scottelari also presented their report. The conclusions of this body are not favourable to the new system—or, at any rate, the gentlemen composing the commission have not been able to confirm the advantages attributed to the method by M. Scottelari, so far as rapidity is concerned. We do not wish to discuss the report, which, by the way, does not furnish any information of the manner in which the trials—there were three of them—were conducted; and in such matters as these the nature of the trial is necessarily of considerable importance. We are persuaded, nevertheless, that the investigation was conducted in a most conscientious spirit; but as the decision is unfavourable, we think it only right to make known what we ourselves have seen in respect to the process.

On Monday last, the 5th February, we repaired by invitation to the atelier of MM. Gillet frères, one of the studios employed for the exhibition of M. Scottelari's process. The weather, pretty fine to begin with, soon became cloudy. At a quarter past two the experiments began. The studio was divided into two parts lengthways by a violet curtain lined with blue. On the left, the window-frames, the walls, and glass were all painted violet; to the left the panes were white and transparent, and the walls painted blue. There were, therefore, two distinct galleries. The experiments began with the reproduction of a painting representing the corridor of a convent, with two nuns ascending the steps; an open window permitted the daylight to enter, and afforded a view of the country in the distance. Although the general appearance of this coloured picture was full of harmony, it offered some very vivid contrasts between the lights and shadows. M. Scottelari took a plate thirteen centimetres by eighteen centimetres, which he coated with collodion, and sensitized before us; upon one half of this plate he made the first impression in the ordinary studio, giving an exposure of two minutes; immediately afterwards, everything, apparatus, object, &c., were transported to the other side of the curtain, illuminated by violet light, and a second exposure was given upon the other half of the plate, one minute being only allowed this time. On development (the sulphate of iron solution being poured over the whole plate at one sweep), image No. 2 at once showed itself, the other coming up more tardily, and only showing in the end but faintly. The plate finished, showed on one side a very perfect and harmonious reproduction, and on the other faint details upon an absolutely transparent ground. Here, therefore, there could be no doubt of the advantage of violet illumination. Next an experiment with portraiture was made. A model was posed successively in the two studios. Thirty seconds' exposure was given, with lighting à la Rembrandt. Here, again, the result was far from doubtful. The image secured in the ordinary studio, although better brought out than in the previous experiment, showed that it suffered for want of exposure. It was hard, and almost destitute of detail. The other was harmonious, presented a delicacy of modelling which did away with the necessity of any retouching. Finally, a third trial was made. It was then twenty minutes to four, and the daylight was rapidly decreasing. The same sitter was posed again for fifteen seconds, illuminated with violet light, and then, for forty-five seconds, in the other gallery. Notwithstanding this great difference in time, however, the first of the two clichés was incontestably the better exposed of the two, more plastic, and, in a word, more successful. This is what we have ourselves witnessed, and have no hesitation in affirming; the clichés are in our own hands, and we shall be happy to show them to anybody who may desire to see them.

M. Collet (of Cherbourg) presented the Photographic Society, at its meeting of the 2nd February, with an apparatus to which he has given the name of *lanceur hydraulique*, and which is destined to fulfil in a much more prompt and

perfect manner the washing of silver prints. It consists of a little wheel with troughs carried upon a support which may be applied to all sorts of troughs in use. This wheel is put into movement by means of an india-rubber tube, which leads into the troughs water from the cistern. In this way a continuous movement is kept up in the water where the prints are washing, and the latter are consequently more satisfactorily and quickly freed from the hyposulphite than is usually the case. Many Parisian photographers have adopted the apparatus, and are doing well with it.

In a recent article in the *Moniteur de la Photographie*, my assiduous collaborateur, M. Boivin, discusses an interesting question connected with carbon printing, namely, the treatment of carbon prints that have been too much or too little exposed. When the printing has been continued too long, the image develops slowly, and remains caked, the result being too vigorous and black. To remedy matters under these circumstances, it is sufficient to drop into the development bath a few drops of a saturated and filtered solution of chloride of lime. The image gradually loses its great vigour under the action of the chloride of lime, which has the property of restoring solubility to the insolated gelatine. When the object desired has been attained, you wash with ordinary water, and then pass the print into a weak solution of hyposulphite of soda; to arrest the action of the chlorine you wash again with water, then put the print into alum and wash once more. If, on the contrary, the exposure has been too short, the image may be strengthened with the aid of the undermentioned solution, namely:

Water	...	...	...	100 parts
Sulphate of iron	...	...	...	3 "
Nitrate of iron	..	...	...	1 part
or a drop of nitric acid.				

After this liquid has been in contact for about a minute with the prints, the latter are washed carefully, and then treated with a very weak solution of pyrogallie or gallic acid. As soon as the requisite effect has been brought about, the prints are washed in plenty of water, and passed into the alum bath, and after a final rinse in very pure water they are allowed to dry. ERNEST LACAN.

MR. KARELINE'S WORKS, AND WHAT MAY BE GATHERED FROM THEM.

BY NORMAN MACBETH, A.R.S.A.*

No one who has witnessed the very admirable collection of photographic works lately exhibited in the Royal Academy National Gallery could have failed to notice, on entering the first room, a few very remarkable specimens of figure subjects, in direct sunlight.

When they first came under my eye, I felt that here we had a thorough mastery of light, and a kind of treatment of it which was certain to give a fresh impulse to the art, and clear away many difficulties which have seemed to be insurmountable, especially in the way of development.

Mr. Kareline (the photographer to whose works I allude) is a Russian, and I have much pleasure in taking this opportunity of congratulating him upon his success in winning the gold medal of the Edinburgh Photographic Society for the picture which, in the opinion of the judges, possessed the highest degree of merit, irrespective of size or subject.

The number of the work (according to the catalogue) which was selected was 775. It was chosen as the best embodiment of Mr. Kareline's skill and general treatment. There were other works by this gentleman which were, perhaps, finer in focus and sharper throughout; but for simplicity, good taste, fine arrangement, and breadth of effect, the work securing the first prize stands alone. Altogether, it is one of the best expositions of the

* Read before the Edinburgh Photographic Society.

general principle which seems to govern all Mr. Kareline's effects, and the chief object of this paper is to point out what appears to me to be his aim, wherein his success lies, wherein he is deficient, and the general lessons we may thus gather.

Mr. Kareline is evidently no novice in his art. His work generally manifests considerable culture, and he is apparently well acquainted with the best-acknowledged theories of composition.

The picture for which the award has been made, and to which I would now call your attention, is in size (the picture proper) 17½ by 20 inches. It is upright in form, and based upon the same composition as that to which Burnet, the engraver, calls our attention when he refers to a special picture of the Dutch school. The picture consists of a figure in light costume placed over a dark background, and another in black placed over a light one.

The subject is a domestic one, but, strictly speaking, it is portraiture treated under a familiar aspect. A husband and his wife are seated in their parlour at tea. The window of the room is visible, draped with white muslin curtains; the farthest in line of the curtain forms (vertically) almost an equal division of the picture, constituting one-half of the space in light and the other in shade. The lady is dressed in a light-coloured silk, with lace tablier over the chest and skirt of dress. She is seated and exposed to direct sunlight, over the shaded part of the background. Three-quarters of the face and body are in shadow, but under the influence of strong reflected light. The gentleman is seated close to the window, dressed in a dark grey tweed suit. His face and body are so situated in shade that they form one entire mass, and that lying over the light, composed of the window and curtains. One not acquainted with art—and especially with the expression of such strong relief as is here presented in attempting to do such a thing—might completely fail in having the composition united; but Mr. Kareline showed his skill when, by the introduction of the little table placed between the two subjects, the objects lying on it—cup, saucer, and tray cloth (being light)—join at the window on one side and on the lady's dress at the other. The objects otherwise throughout the picture, which serve to lead off the light and fill up spaces, are also skillfully arranged, and that without being too conspicuous. For instance, the great mass of shade in the back of the room is subdivided at a very fine forte point of this space by the introduction of the oil-lamp bracket and its globe. Had not that been there its want would have been felt, and the picture appear to be out of balance. Then, also, the seat of the chair behind the lady laterally distributes and carries away some of the light, which, without it, would preponderate on the lady's dress.

The treatment of lines, also, in this composition is interesting. The lady, holding an album, and the gentleman, unconsciously in the act of holding a cup (to appearance, by their unity), the lines of the arms may be said to resemble the inner lines of the capital letter M. While the main lines of the body of each resemble the outer lines of the same letter.

It is of the greatest importance that a distinct basis exist in every composition. Architects well know the value of this; the more that we can resolve upon a distinct form, by whatever way it may be suggested, the more is our design likely to be original, well connected, and varied. Mr. Kareline pays great attention to variety of forms, even in one subject. In the prize picture we have little or no repetition. The lady's head looks toward the spectator, while the head of the gentleman is in profile, and looking towards the lady. The aerial perspective of all Mr. Kareline's works is also worthy of remark. In the particular work under notice, while the extremes of light and shade are brought into juxtaposition, yet there is no violence. The lady's figure, by her light dress being placed over the shaded part of the room, becomes connected with

the background by her hair, which, being darker than the shade of the wall, appears sufficiently well made out, and, at the same time, graduated.

There are several of Mr. Kareline's works which are in better development throughout than this. Some of the shadows have not the light fully taken up in them, and there is a defective part in the wall of the background which has been restored evidently by stippling. Upon the closest inspection, this picture appears to have been printed from a negative directly taken, and not a combination. It is very little, if anything, touched-up, and never has any work been more entitled to be classed among those of which the motto holds good, "It is the highest art which conceals art." Visitors to the Exhibition (unacquainted with the art) have been greatly disappointed with this work on the first sight of it, and wondered what was to be seen in it. Painters and photographers, again, admire its simplicity of treatment, and the latter are generally puzzled as to the manner in which Mr. Kareline manages his light.

But I believe there there is no mystery in that; unquestionably, Mr. Kareline employs powerful reflectors, and at the same time has great regard to the fulfilment of natural effects. Of late, many methods of the treatment of light have been introduced, such as those styled "Rembrandt;" but the style has been too apparent, too oft repeated, and too artificial. However, it was a step in advance, and infinitely better than those effects which were the result of a glass house without any concentrated light, producing no shadows, and, consequently, no light predominating. But here—and it is one of the chief merits of Mr. Kareline's work—the main source of light is strongly marked by direct sunlight, and all the parts being in shade under the influence of treatment by reflection. The development of sunlight on the lady's face in this picture, however, has partially faded, i.e., there is not a complete realization of her complexion by reason of too dense a deposit being thrown on these parts, from which we may infer that the negative has been a little short of exposure; but in most of Mr. Kareline's work—for instance, in that of his own portrait—it is the development of the flesh tints, and the manifestation of the highest lights on fine linen, or glistening objects, such as silver or crystal, that make his works very singular. I believe the mystery of his method lies more in chemistry, and by a process of development which, if I may hazard a conjecture, it is probable, that after careful study of his arrangement, both subject of and accessories—everything prepared for action—the lens is opened and the sitters subjected to very short exposure (if not instantaneous); and by a method of development—say such as Mr. Mudd pursues in the application of plain pyro. to collodion-albumen plate—all the detail is made manifest previous to rendering by silver the respective density of parts, according to their exposure to light, or like that of Captain Abney's more recent discovery in his process of development by the application of emulsion, through which he brings out the most latent impressions of very short exposure.

(To be continued.)

LICHTDRUCK IN WATER COLOURS.

BY J. HURNIE.*

SOME six years ago I endeavoured to find an explanation for the qualities possessed by an exposed bichromated gelatine image, for the recognised theory did not appear to be satisfactory. It is usual to say that water repels the fatty pigment, and therefore in those places where the gelatine has been more or less swollen with water, less of the fatty ink attaches itself; where, however, the gelatine is not in a position to take up much water,

* Read before the Vienna Photographic Society.

there a larger quantity of the ink attaches. This answer is right enough, but it does not exhaust the question. No doubt the degree of moisture or dryness of the gelatine is the principal cause of the greater or less adherence of greasy ink, but it is not only water that repels the fatty matter, but every easily liquefied substance which possesses no stickiness. Even oil will repel a more solid and fatty substance, only it is necessary for the latter to be sticky, or in other words of a tenacious character, lengthening itself out in long threads on treatment with the roller.

In order to explain the matter more clearly, I will give a simple illustration. If we take a thick solution of gum-arabic upon the finger, and touch with this sticky substance a dry body of any kind—such, for instance, as glass or paper, or another finger for that matter—it will be found that the gummy finger will stick very close to the object it has touched. By suddenly tearing away the finger, the gummy mass is divided into two masses, of which only one half remains on the finger, while the remainder attaches to the object touched. Quite different, however, would it be if the object touched were not dry, but wet. The gummy mass no longer adheres in that case, and it may be removed again without leaving behind it a trace upon the object touched. It is necessary, indeed, to have recourse to a little friction if it is desired to rub off a little of the sticky gum upon the wet surface, so that the water mixes with the mass, and itself becomes thicker.

The same phenomenon is observed when, instead of a thick gum solution, a thick varnish or an oil colour is carried to one's finger, and the latter then first applied to a dry surface, and subsequently to one moistened with oil. In the latter case, if a thin liquid oil has been employed, there will be no adherence of the paint or varnish, as was the case with the water and gum. The finger in the last experiment is easily removed again, a small portion of the oil upon the object being carried away with the finger at the same time; so that we have direct reverse of what I previously referred to. Not only, therefore, does water repel a fatty colour, but every limpid fluid repels a thick one, even when it is a question of two bodies of the same nature, but the one of a thicker consistence than the other.

I took a very thick solution of gum-arabic, added to it glycerine and pigment, and treated therewith a Lichtdruck plate. I then found that this colouring matter attached itself in precisely the same manner as if it had been a greasy ink. The first print I secured was not a very good one, neither did I succeed with the second and the third; for it is necessary that the thickness and consistence of the ink should stand in a certain fixed relation to the dryness of the gelatine film. This relation, however, is soon brought about of itself. If the colour is too thick and the gelatine film too wet, the image takes up very little colour at all, but the colour, on the other hand, draws out some of the water from the film. In the first print, too, some of the water attaches to the paper, and the image becomes drier, so that on the second application of the colour-roller more and more ink attaches, until at last, after a little working, the Lichtdruck plate possesses just the right quantity of moisture necessary for securing good impressions. When this has been attained, the relation of dryness and moisture remains constant, and the operation continues with uniformity. The gum-colour gives at every inking as much water to the film as its condition in the different parts requires, so that by this mode of printing the manipulations of damping and sponging that have usually to be carried on fall away altogether. This method of Lichtdruck printing with water colour is, therefore, specially suited for quick-printing presses.

The gum or water colour is prepared in the following manner. Some gum-arabic is allowed to swell in water, and then as much glycerine is added as in the first place gum was employed, and the water is finally boiled quite out.

A provision of very sticky firm gum solu-

tion, which will not dry any further. To this mass any desirable quantity of colouring matter may be added. The best to use, under the circumstances, is, perhaps, ready prepared Indian ink. At the same time fine lamp-black mixed with iron-violet may be employed, water being added to the same before it is rubbed fine on a palette. When the mixture of gum and colour has been well incorporated, it is heated once more upon a copper plate to dissipate the water, and bring the compound back again once more to its former firm and solid consistence. In this condition it is that the colour is kept; on cooling it becomes yet firmer. Care must be taken in printing not to employ too much of this colour, as under these circumstances its fibrous character appears to be too short upon the roller, and the pigment fails to draw out in long threads. To employ the colour or ink, as it may be termed, it is first of all thinned down as much as desirable with glycerine—not too much, however—until it has the consistence of lithographic ink. The roller to be employed in spreading the colour must for some days previously have been saturated with glycerine, so that it will not absorb moisture from the colour itself during the operation of rolling. In printing, the same regulations are to be observed as in ordinary lithography or Lichtdruck. Too thin an ink gives flat pictures without any white lights; too thick an ink, on the contrary, yields strong shadows and white lights, and, therefore, hard pictures. The greater part of the impressions which I submit to the Society have been printed more than six years, and still remain unchanged.

The pictures, if properly printed, are dry as soon as they are produced; the colouring matter is already very dry when applied, so as to be incapable of being smeared, and any superfluous moisture is absorbed by the paper bearing the impression. The paper must be moistened to a certain degree when put into the press, as otherwise it would absorb moisture too greedily from the gelatine printing block, and it would then be necessary to pass and repass the roller many times to re-establish the proper balance of moisture and dryness. If a gelatine block becomes robbed of its moisture altogether, it will begin to take up colour all over its surface, and then the image will appear quite black. It is necessary, as I have already said, to roll the plate for a long time until the gelatine has again absorbed sufficient moisture from the ink itself. If properly manipulated, this constant relation between ink and plate may be maintained without difficulty, and the printing then goes on with considerable rapidity.

The prints produced in this manner will bear treatment with water, gelatine, or varnish, so that any medium almost may be made use of to secure a high polish if it is desired. Only it must be borne in mind that the pictures must not be rubbed in a moist condition, as they are easily smudged. This disposition of the picture to become injured by rubbing when in a moist condition is, in fact, the only way to tell of the presence of water-colour, and the only defect as compared to prints in lithographic ink. If none of these pictures are ever permitted to come into contact with wet objects, the practice of water-colour printing in this manner is without a defect; while by following the method I have pointed out, many great advantages are secured by working in the manner indicated. The colours or inks employed are cheaper, and, at the same time, do not possess the inconvenience of drying in their tubes or boxes, and, for this reason, no loss need be apprehended by keeping them. The rollers retain their elasticity for a much longer period, and no hard crusts form upon the surface which have to be continually scraped off with a spatula, as in the case of lithographic work. Again, the hands are much more easily washed and freed from dirt, as, indeed, is the case with the blocks and rollers, &c. Finally, the air is not full of unpleasant odours of turpentine, and the work may be carried on, therefore, far more pleasantly.

ON SENSITIZING THE COLLODION FILM.

BY J. KAY.

AFTER the plate is collodionised, it is sensitized by immersion in the silver bath. And how long ought the plate to remain in the silver solution? This is a question of importance. I scarcely know of another so important. Unfortunately, it is one that cannot be answered in a short sentence. When I look through many of the negatives that are produced in some establishments, I find that the principle involved in this question is not understood there. Some teachers have said that when the plate is first put into the bath, it must be kept in continual motion until all traces of "greasiness" have disappeared; it is then time to withdraw it. That may be quite true under many conditions, but the teaching itself is defective. It leads one to suppose that the absence of "greasiness" is the all-important determining point. When we come to inquire into the facts of the case, we very soon see that the thing to be obtained by the immersion of the plate in the silver solution is the sensitiveness of the collodion film. And, in answering the question with which I started, we must know what the exact character of the sensitizing solution is.

An error prevails among many photographers when they suppose that with a new bath the plate requires rapid immersion. Rapid immersion may be necessary with a new bath under certain circumstances, but I maintain that the point to be determined is not the age of the bath, but its condition. Here is a new bath of 90 ounces, strength 40 grains, slightly acidified, and saturated with iodide. Let us try a plate on the theory of "movement until all traces of 'greasiness' have disappeared." The time required for the working of this theory is very short—just about a minute. Exposed, developed, and fixed, we have a negative which has all the elements of an imperfectly sensitized film. I have seen hundreds of such negatives, nothing in them, no quality; they appear to be under-exposed; and yet, when put against the coat sleeve, one can see that they are well exposed. The printer dreads the sight of such negatives—they are exceedingly difficult to print, and the prints even more difficult to tone. With such negatives I have known operators condemn, in unmeasured terms, collodion, bath, developer, glass house, light, and, in short, every thing but the right thing. We will try another plate in the same bath, recollecting, however, the most important thing of all—namely, its condition—highly iodized. We need not, therefore, be afraid of the plate remaining in the bath after "all traces of 'greasiness' have disappeared." We will let it remain in the bath, say, for five or six minutes. Exposed, developed, and fixed, we have before us a negative as much like the other as "chalk is like cheese." The plate fully sensitized, the negative is in every respect satisfactory.

Here is another new bath containing the same quantity as the last, and of the same strength, but *not* iodized. In this case, we will follow the plan of many excellent operators who iodize by immersing a collodionised plate, 8½ by 6½, in the bath, and leaving it there all night. The bath now is—well, I won't say only partially iodized, it is not saturated with iodide. We shall have proof of that presently. Now, in this case, and under these conditions, the thing required in sensitizing is rapid immersion. Should the plate be left in the bath many minutes, the collodion will lose its sensitive properties, commencing from that part of the plate where the deposit is the thinnest; and this is the proof that we have that the bath is not saturated with iodide.

Let operators—especially those of scanty experience—use largely and unparaphrasingly of that all-important ingredient of all photographic formulae, brains, and observe the conditions and circumstances under which good and bad negatives are obtained, and they will rarely, if ever, be bothered and perplexed, as many are, by a remarkably good negative

this time, and a remarkably indifferent one the next. I would recommend baths saturated with iodide. For my own part, I do not think that you can over-iodize. At any rate, I find it to be safer to work with highly iodized baths than otherwise.

Just one thing in conclusion. I ought to say that the effects which I have indicated as arising from a rapid immersion of the plate in a bath highly iodized may, to some slight extent, be obviated by keeping the plate out of the bath for a considerable time before developing. This, indeed, is done in many establishments when several positions are taken on one plate.

I enclose one or two prints from negatives sensitized in a highly iodized bath.

[The prints enclosed are very fine indeed.—Ed.]

M. BOIVIN'S METHOD OF TREATING THE SILVER BATH.*

Of all the methods described for ascertaining the strength of one's silver bath, there is none I have found more convenient to use, and more economical, than that herein referred to. The apparatus required is of the simplest description. I take a graduated burette marked off into cubic centimetres, which may be purchased of any purveyor of scientific apparatus. Into this apparatus I pour some of the undermentioned liquid as far as the mark 0; namely,—

Distilled water	...	1000 cub. cent.
Dry chloride of sodium	...	6.9 grammes
Bichromate of potash	...	1 gramme

I next take a test-tube, and introduce into it precisely two cubic centimetres of the silver solution, the strength of which I want to discover. I hold this test-tube under my burette, and from the latter permit the liquid to fall drop by drop.

The burette being provided by a means whereby the solution of salt it contains may be allowed to escape drop by drop, it is an easy manner to regulate the amount of liquid that falls into the test-tube.

The purple precipitate at first formed by the falling of the liquid into the test-tube soon passes to white, and the moment this happens the operator looks at his burette to see how much liquid has escaped to bring about this result. The figure or degree marked upon the glass denotes the weight of nitrate of silver contained in every hundred cubic centimetres of the liquid under examination.

It is very preferable to employ this means of estimating the silver contained in a solution rather than the argentometers and other apparatus in general use with photographers, as these are often affected by salts contained in the solution other than those of silver. In the method above described, on the other hand, it is only silver salts that influence the test.

ALBUMEN SUBSTRATUM.—A correspondent says:—"I notice the remarks in your journal as to the use of an albumen substratum to collodion films, and can bear my testimony to the immense amount of ill-usage which a film with albumen substratum will bear without injury. In a first attempt (encouraging, but not quite successful) which I made yesterday to produce a transparency with nitric acid, &c., as detailed in your YEAR-BOOK, I used one of Ohambers' uranium dry plates developed with alkaline pyro, then flooded with strong nitric acid; then redeveloped and fixed; then twice flooded with chloride of gold solution, and twice again with alkaline developer. The plate, which has an albumen substratum, actually bore all this ill-usage without the film giving way."

* *Monsieur de la Photographie.*

there a larger quantity of the ink attaches. This answer is right enough, but it does not exhaust the question. No doubt the degree of moisture or dryness of the gelatine is the principal cause of the greater or less adherence of greasy ink, but it is not only water that repels the fatty matter, but every easily liquefied substance which possesses no stickiness. Even oil will repel a more solid and fatty substance, only it is necessary for the latter to be sticky, or in other words of a tenacious character, lengthening itself out in long threads on treatment with the roller.

In order to explain the matter more clearly, I will give a simple illustration. If we take a thick solution of gum-arabic upon the finger, and touch with this sticky substance a dry body of any kind—such, for instance, as glass or paper, or another finger for that matter—it will be found that the gummy finger will stick very close to the object it has touched. By suddenly tearing away the finger, the gummy mass is divided into two masses, of which only one half remains on the finger, while the remainder attaches to the object touched. Quite different, however, would it be if the object touched were not dry, but wet. The gummy mass no longer adheres in that case, and it may be removed again without leaving behind it a trace upon the object touched. It is necessary, indeed, to have recourse to a little friction if it is desired to rub off a little of the sticky gum upon the wet surface, so that the water mixes with the mass, and itself becomes thicker.

The same phenomenon is observed when, instead of a thick gum solution, a thick varnish or an oil colour is carried to one's finger, and the latter then first applied to a dry surface, and subsequently to one moistened with oil. In the latter case, if a thin liquid oil has been employed, there will be no adherence of the paint or varnish, as was the case with the water and gum. The finger in the last experiment is easily removed again, a small portion of the oil upon the object being carried away with the finger at the same time; so that we have direct reverse of what I previously referred to. Not only, therefore, does water repel a fatty colour, but every limpid fluid repels a thick one, even when it is a question of two bodies of the same nature, but the one of a thicker consistence than the other.

I took a very thick solution of gum-arabic, added to it glycerine and pigment, and treated therewith a Lichtdruck plate. I then found that this colouring matter attached itself in precisely the same manner as if it had been a greasy ink. The first print I secured was not a very good one, neither did I succeed with the second and the third; for it is necessary that the thickness and consistence of the ink should stand in a certain fixed relation to the dryness of the gelatine film. This relation, however, is soon brought about of itself. If the colour is too thick and the gelatine film too wet, the image takes up very little colour at all, but the colour, on the other hand, draws out some of the water from the film. In the first print, too, some of the water attaches to the paper, and the image becomes drier, so that on the second application of the colour-roller more and more ink attaches, until at last, after a little working, the Lichtdruck plate possesses just the right quantity of moisture necessary for securing good impressions. When this has been attained, the relation of dryness and moisture remains constant, and the operation continues with uniformity. The gum-colour gives at every inking as much water to the film as its condition in the different parts requires, so that by this mode of printing the manipulations of damping and sponging that have usually to be carried on fall away altogether. This method of Lichtdruck printing with water colour is, therefore, specially suited for quick-printing presses.

The gum or water colour is prepared in the following manner. Some gum-arabic is allowed to swell in water, and then as much glycerine is added as in the first place gum was employed, and the water is finally boiled quite out. You now have a provision of very sticky firm gum solu-

tion, which will not dry any farther. To this mass any desirable quantity of colouring matter may be added. The best to use, under the circumstances, is, perhaps, ready prepared Indian ink. At the same time fine lamp-black mixed with iron-violet may be employed, water being added to the same before it is rubbed fine on a palette. When the mixture of gum and colour has been well incorporated, it is heated once more upon a copper plate to dissipate the water, and bring the compound back again once more to its former firm and solid consistence. In this condition it is that the colour is kept; on cooling it becomes yet firmer. Care must be taken in printing not to employ too much of this colour, as under these circumstances its fibrous character appears to be too short upon the roller, and the pigment fails to draw out in long threads. To employ the colour or ink, as it may be termed, it is first of all thinned down as much as desirable with glycerine—not too much, however—until it has the consistence of lithographic ink. The roller to be employed in spreading the colour must for some days previously have been saturated with glycerine, so that it will not absorb moisture from the colour itself during the operation of rolling. In printing, the same regulations are to be observed as in ordinary lithography or Lichtdruck. Too thin an ink gives flat pictures without any white lights; too thick an ink, on the contrary, yields strong shadows and white lights, and, therefore, hard pictures. The greater part of the impressions which I submit to the Society have been printed more than six years, and still remain unchanged.

The pictures, if properly printed, are dry as soon as they are produced; the colouring matter is already very dry when applied, so as to be incapable of being smeared, and any superfluous moisture is absorbed by the paper bearing the impression. The paper must be moistened to a certain degree when put into the press, as otherwise it would absorb moisture too greedily from the gelatine printing block, and it would then be necessary to pass and repeat the roller many times to re-establish the proper balance of moisture and dryness. If a gelatine block becomes robbed of its moisture altogether, it will begin to take up colour all over its surface, and then the image will appear quite black. It is necessary, as I have already said, to roll the plate for a long time until the gelatine has again absorbed sufficient moisture from the ink itself. If properly manipulated, this constant relation between ink and plate may be maintained without difficulty, and the printing then goes on with considerable rapidity.

The prints produced in this manner will bear treatment with water, gelatine, or varnish, so that any medium almost may be made use of to secure a high polish if it is desired. Only it must be borne in mind that the pictures must not be rubbed in a moist condition, as they are easily smudged. This disposition of the picture to become injured by rubbing when in a moist condition is, in fact, the only way to tell of the presence of water-colour, and the only defect as compared to prints in lithographic ink. If none of these pictures are ever permitted to come into contact with wet objects, the practice of water-colour printing in this manner is without a defect; while by following the method I have pointed out, many great advantages are secured by working in the manner indicated. The colours or inks employed are cheaper, and, at the same time, do not possess the inconvenience of drying in their tubes or boxes, and, for this reason, no loss need be apprehended by keeping them. The rollers retain their elasticity for a much longer period, and no hard crusts form upon the surface which have to be continually scraped off with a spatula, as in the case of lithographic work. Again, the hands are much more easily washed and freed from dirt, as, indeed, is the case with the blocks and rollers, &c. Finally, the air is not full of unpleasant odours of turpentine, and the work may be carried on, therefore, far more pleasantly.

ON SENSITIZING THE COLLODION FILM.

BY J. KAY.

After the plate is collodionized, it is sensitized by immersion in the silver bath. And how long ought the plate to remain in the silver solution? This is a question of importance. I scarcely know of another so important. Unfortunately, it is one that cannot be answered in a short sentence. When I look through many of the negatives that are produced in some establishments, I find that the principle involved in this question is not understood there. Some teachers have said that when the plate is first put into the bath, it must be kept in continual motion until all traces of "greasiness" have disappeared; it is then time to withdraw it. That may be quite true under many conditions, but the teaching itself is defective. It leads one to suppose that the absence of "greasiness" is the all-important determining point. When we come to inquire into the facts of the case, we very soon see that the thing to be obtained by the immersion of the plate in the silver solution is the sensitiveness of the collodion film. And, in answering the question with which I started, we must know what the exact character of the sensitizing solution is.

An error prevails among many photographers when they suppose that with a new bath the plate requires rapid immersion. Rapid immersion may be necessary with a new bath under certain circumstances, but I maintain that the point to be determined is not the age of the bath, but its condition. Here is a new bath of 90 ounces, strength 40 grains, slightly acidified, and saturated with iodide. Let us try a plate on the theory of "movement until all traces of 'greasiness' have disappeared." The time required for the working of this theory is very short—just about a minute. Exposed, developed, and fixed, we have a negative which has all the elements of an imperfectly sensitized film. I have seen hundreds of such negatives, nothing in them, no quality; they appear to be under-exposed; and yet, when put against the coat sleeve, one can see that they are well exposed. The printer dreads the sight of such negatives—they are exceedingly difficult to print, and the prints even more difficult to tone. With such negatives I have known operators condemn, in unmeasured terms, collodion, bath, developer, glass house, light, and, in short, every thing but the right thing. We will try another plate in the same bath, recollecting, however, the most important thing of all—namely, its condition—highly iodized. We need not, therefore, be afraid of the plate remaining in the bath after "all traces of 'greasiness' have disappeared." We will let it remain in the bath, say, for five or six minutes. Exposed, developed, and fixed, we have before us a negative as much like the other as "chalk is like cheese." The plate fully sensitized, the negative is in every respect satisfactory.

Here is another new bath containing the same quantity as the last, and of the same strength, but not iodized. In this case, we will follow the plan of many excellent operators who iodize by immersing a collodionized plate, 8½ by 6½, in the bath, and leaving it there all night. The bath now is—well, I won't say only partially iodized, it is not saturated with iodide. We shall have proof of that presently. Now, in this case, and under these conditions, the thing required in sensitizing is rapid immersion. Should the plate be left in the bath many minutes, the collodion will lose its sensitive properties, commencing from that part of the plate where the deposit is the thinnest; and this is the proof that we have that the bath is not saturated with iodide.

Let operators—especially those of scanty experience—use largely and unsparringly of that all-important ingredient of all photographic formulae, brains, and observe the conditions and circumstances under which good and bad negatives are obtained, and they will rarely, if ever, be bothered and perplexed, as many are, by a remarkably good negative

this time, and a remarkably indifferent one the next. I would recommend baths saturated with iodide. For my own part, I do not think that you can over-iodize. At any rate, I find it to be safer to work with highly iodized baths than otherwise.

Just one thing in conclusion. I ought to say that the effects which I have indicated as arising from a rapid immersion of the plate in a bath highly iodized may, to some slight extent, be obviated by keeping the plate out of the bath for a considerable time before developing. This, indeed, is done in many establishments when several positions are taken on one plate.

I enclose one or two prints from negatives sensitized in a highly iodized bath.

[The prints enclosed are very fine indeed.—Ed.]

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* *Illustré de la Photographie.*

The Photographic News.

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M. KARY'S SYSTEM OF LIGHTING.

ABOUT twelve months ago we called the attention of our readers to the announcement of a new system of lighting claimed by M. Kary, a photographer in Algiers. M. Kary's system was described in a pamphlet issued to subscribers at the rate of one hundred francs (£4) for each copy. Our editorial correspondent, Mr. Charles Waldack, informed us at the time that the system was based on the use of screens both for increasing light by reflection, and softening it by shutting the model; and that a similar system had been described in our columns as the practice of Mr. Myers, an American photographer. From another source we learnt that M. Kary used hand-screens covered with white, blue, pale tints of red and orange, and other colours according to the result required.

We have recently received from M. Kary a somewhat extensive circular calling attention to his pamphlet, and to the notices from many authorities of his system and its results, including the names of many distinguished practical photographers and scientific men in France. One of our correspondents, Mr. F. Row, of Braintree, has recently favoured us with a sight of some of M. Kary's specimens, which are certainly very fine, and manifestly the work of a man of thoroughly artistic feeling; the lighting and treatment generally are decidedly good. As we have repeatedly before said, we believe that the use of portable screens and reflectors as adjuncts in securing effective and harmonious lighting of the model has not received half the attention of which it is worthy; and we hope that M. Kary's work will be extensively read, as, judging from the opinions of practical men like Fritz Luckhardt, of Vienna, and others, the principles of lighting photography are ably treated. As we are writing for the information of our readers, rather than to advertise M. Kary's pamphlet, it is sufficient to add here, that M. Kary sends out his little work in English translation, and his address is Gallery Malakoff, Algiers. Those interested in the description of Mr. Myers, to which we have referred, will find full details in our eighteenth volume, and also the *Photographic News* of last March 17th, p. 127.

A point to which Mr. Kary calls especial attention is the relation in time of exposure which his system of using screens permits. This may readily be understood. An old and excellent rule in relation to exposure is, "Expose for the shadows, the light will then take care of themselves;" and the long exposure at times required in portraiture is rarely required for the same or much as for

some deep shadow in drapery, or for the hair. By the use of portable reflectors these obscurely-lighted portions can be made to receive a greater amount of light, rather than a longer period of the ordinary lighting. This would manifestly confer an advantage, as the prolonged exposure required by the dark portions of the model often burns out the detail from lighter portions. In like manner, extremely light portions of drapery, which really require a shorter exposure than the sitters, and drapery generally, may have the light carefully screened off during the whole or a part of the exposure. The advantages of a merely technical kind gained by the use of portable screens are very valuable; but they are comparatively trifling and subsidiary to the aid they afford the artist in producing pictorial effect, of which the introduction and uniting of shadows is such an important part. A photographer should always remember that the mere representation of an object is not a picture, unless by the management of light and shadow it presents what is recognized as pictorial effect. And there is no aid to the introduction and control of light and shadow like the portable screen, which, in the hands of an artist, would produce in every portrait a picture. Let the young portraitist try this, practicing awhile first with plaster models, placing them in full light, and then try what variety of effect of light and shade may be produced by the use of screens alone during exposure. The lessons gained in such practice will be most valuable. Some idea of the use of such screens having been gained, then try to produce specific effects of lighting, such as may be seen in the works of the great portraitists. We are not here recommending imitation to portraitists, although we do not say that photographers might not often, if they can, imitate the work of great painters with advantage. But we have been in these remarks merely recommending a certain course for educational practice. Until the portraitist has mastered the use and management of screens, we should not recommend him to introduce them into his daily practice, as he may easily miss the result at which he aims, and startle his sitters. Skill and judgment should, of course, govern the use of the screen in actual practice.

A PAINTER ON THE EDINBURGH EXHIBITION.

THE days when hot discussions were maintained as to the art claims of photography are happily over. We may happily, because no amount of discussion affected the fact, nor seriously affected the recognition or denial of the art claims made of our art science. Whatever the art claims of photography may be, it has always been affiliated to art. Daguerre was an artist, and the earliest and ablest of photographers have generally had artistic training. The first president of the Photographic Society was also the president of the Royal Academy, Sir Charles Eastlake, one of its vice-presidents being another artist, Sir Wm. Newton. The president of the Royal Scottish Academy, and an Associate of the same Academy, were members of the recent jury of award at Edinburgh; and now we find the same Associate of the Royal Scottish Academy, a painter of great ability, delivering a lecture full of interest and instruction on the contributions of the first prize man at the Exhibition. More than once, incidentally, the speaker repudiated the idea of art claims for photography. But photographers may find consolation in the fact that he criticized the prize picture of M. Karelina as a work of art, and pointed out how the art qualities were secured by decidedly formative process: breadth, as he showed, being obtained by uniting the masses of light and shadow by the accessories on the table. Our object, here, is not to revive the discussion, or insist on art qualities in photography; but to commend a careful study of the criticism to portraitists, who may, without seeing the picture, realize the composition and the management of its art qualities from the remarks of Mr. Macbeth.

MESSRS. BURROWS AND COLTON'S RETOUCHING DESK.

THE legitimacy of retouching as a desirable aid to excellence of result, having, we think, been satisfactorily demonstrated in these pages, every aid and appliance which can facilitate such work, or facilitate excellence in executing it, becomes of vital importance. The retouching desk devised by Messrs. Burrows and Colton comes pre-eminently within the category of such aids. A desk which enables the retoucher to see perfectly his work, get at it with ease and facility, and continue working with precision and comfort, must materially tend to excellence in result.

This desk is manifestly the outcome of experience, the invention of one who has felt what was wanted. The diagram will give an idea of the general arrangement of



the frame, which is good, but not essentially novel; it is in the special appliances that unusual advantages will be found. In the first place, it is full of convenient adjustments to any position or mode of working. The retoucher may as easily sit upright to the work, as in a leaning round-shoulder-inducing position. Of the base we need not say more than that it contains a drawer for holding loose portions of the desk, pencils, &c., and is provided with a pencil sharpener in a handy position. Attached to the base is the desk proper, which can be placed at any suitable angle. It is provided with a circular revolving inner frame, with clamping screws, sliding in a groove to permit them to hold firmly negatives of various sizes. Behind a central aperture in this revolving table or stage is an attachment on the principle of a series of revolving diaphragms, containing three apertures, any one of which can, on revolving the disc in which they are contained, be brought immediately behind the aperture in the desk, over which the negative rests during retouching. This arrangement affords a most ingenious facility for modifying the lighting through the negative. Every one who has attempted retouching negatives is familiar with the fact that much of the comfort of working, and much of the character of the finished work, depends upon the lighting of the negative during the operation. In this revolving disc, in each of the three apertures is a different kind of glass; one plain clear glass, one fine ground glass, and one opal glass. This arrangement enables the manipulator to judge with accuracy as to the effect of his work on the negative, and guides him in modifying the amount or style of the work he is applying. Placed underneath the desk in a proper position on the base is a concave silvered reflector, for throwing up a satisfactory light on the negative, which is of great value, either for daylight or artificial light. As the circular table or stage in the desk readily revolves, the artist is enabled to bring

the negative in a moment into a satisfactory position for working on.

By no means the least important adjunct to this desk is the magnifying-glass, attached to a steady, movable arm of brass, with adjustment to place it in any position and at any focus to suit the artist. The importance of steadiness in the position of the magnifier cannot be overestimated in saving the eyes of the workman.

The desk, when closed, packs up into a convenient flat space.

We find that after a verbal enumeration and description of the varied convenient appliances which appertain to this desk, but a meagre idea is given of its actual completeness and efficiency. But we have no hesitation in giving it our heartiest commendation, and remarking that as Messrs. Burrows and Colton have produced the best book on retouching which has been issued, they have also produced beyond all comparison the best desk for aiding in producing good work and securing the convenience and comfort of the retoucher.

TINTING AND GLAZING PICTURES.

IN a recent number of the *Archiv* there appears a note by M. Stuting, recommending the employment of aniline-violet to improve the tone of gelatinized prints. This gentleman states that albumenized prints which receive a coating of gelatine to increase their brilliancy not unfrequently appear more yellow in the whites than was previously the case, and this defect, he states, may be avoided by the application of a small quantity of aniline-violet.

The glazing of the picture is undertaken in the ordinary way, but previously to the prints being laid down upon the gelatine or collodionized glass they are first of all put into a weak solution of aniline violet. This solution must be quite free from dust, and the pictures must be dipped into it face downwards; any particle of dust causes minute spots of deep colour, which are not to be removed subsequently. The tinting of the photograph in this manner annuls the yellow tone of the whites, which is often exaggerated when by the gelatine coating. The pictures should be vigorously printed, and toned of a brownish colour, so that they may not appear weak when glazed. This tinting with aniline-violet may be recommended also for large portraits, to which it imparts a beautiful and luscious tone.

M. Stuting is quite right in attempting to counteract the yellowness which some gelatinized prints undoubtedly possess, but the use of aniline colours, as a rule, is scarcely to be recommended, from the circumstance that they are so liable to fade. However, if it is desired to employ such pigments upon photographs, without giving them that high brilliancy which gelatine and collodion spread upon glass always imparts, they may with facility be dissolved in normal collodion, and this poured over the mounted or unmounted picture in the same way as if one were coating a plate.

THE AUBELDRUCK PROCESS.

A good deal of speculation is rife in regard to this mechanical printing process, which has attracted a good deal of attention in Germany. It is the invention of M. Aubel, of Cologne, and its results (though far from perfect at present) show considerable vigour and depth, which Lichtdruck prints not unfrequently lack. The Aubeldruck printing blocks are of metal, and may be worked in the printing press, so that for this reason alone the process has much to recommend it.

The manner in which M. Aubel converts a negative into a printing block is still maintained a close secret; but a German journal, the *Arbeitsgeber*, professes to have found out the secret. A negative of any design, sketch, or writing is

black and white, is secured; and the silver deposited upon the glass plate to form the image is then strengthened by further deposition of silver by means of the electrolyte process. A couple of hours suffices to make the deposit of metal thick enough, and then the image upon the glass is submitted to the action of hydro-fluoric acid vapour. This vapour attacks the glass in all parts where it is not covered with silver, and in a little while there is produced upon the glass the image in relief.

We suppose that from this a galvano-plastic image is taken, which constitutes the block for printing purposes, for it would never do, of course, to use plate-glass in a printing press; and for this reason, probably, a positive, and not a negative, would be required in the first instance. This, however, is a mere matter of detail, and does not, in any way, touch the principle of the process.

In another German journal—the *Archiv*—appears a letter, also touching upon the Aubel process, in which it is stated that according to some experiments undertaken by the author, M. E. Selinger, he is of opinion that it is not a silver image that is employed to cover the glass, and thus prevent the action of the hydrofluoric acid fumes, but lead, with which the original negative is intensified. There is every probability, we think, of such being the case. In the first place, it is very difficult to deposit silver equally upon a negative film by the aid of a galvanic battery, as in the electrolyte process, while, on the other hand, the process of intensifying by the aid of nitrate of lead, as recently pointed out by those thorough experimentalists MM. Eder and Toth, is a very facile one to carry out. Moreover, nitrate of lead, applied in this manner to a photographic film, has the effect of depositing a very dense film of that metal upon the glass plate, and lead, as chemists know, is not attacked by hydrofluoric acid fumes. We cannot, therefore, but doubt that the plan suggested by M. Selinger is the one adopted by M. Aubel in the production of his plates, as affording the most simple and certain method of proceeding.

Anent the use of lead as an intensifier, we may here record an interesting experiment. We have for some months past been witness to the employment of the nitrate of lead intensifier of MM. Eder and Toth. If only care is employed in using distilled water in the washing, there is no chance whatever of staining, and the most perfect photo-lithographic negatives, with the blackest of grounds, may be secured with it. The other day, however, our attention was called to a glass plate upon which a drawing had been photographed and intensified with lead. For some reason or other the picture was a failure, and the film consequently washed off, and the plate put by for further use. On a close examination of it, subsequently, there was found etched upon its surface, in dull lines, the photographic image. Every line was sharp and clear, and could only be removed by considerable friction. Here is a hint that should be useful both to glass etchers and to the producers of spirit photographs.

Correspondence.

NORTHERN NOTES.

SIR,—We are not nearly tired of the Edinburgh Photographic Exhibition. The photographers there are greatly exercised by some of Karelino's pictures. It is said that the medal has been given more in consideration of inexplicable lighting than from any great merit they possess. Now, this must be the invention of a disappointed exhibitor, although I must acknowledge that I could look at them without going into fits; and having seen them, I must say that there is nothing mysterious about them. The medal group is taken at a single exposure, in a room or studio; through a window streams of sunlight fall upon two figures. The shadow side may be softened by a reflector or distant window. To say that the picture is taken in Russia is half the mystery solved; for every picture I have seen from that

region gives evidence of a clear transparency in the atmosphere which we once or twice in a life-time experience.

The Glasgow Photographic Association advertises lately "that a number of the Edinburgh Exhibition prize photographs" would be on view at the Gallery of the Society. It is further intended to sit on the prize picture at an early meeting of the Association. I wonder if the Glasgow men will be pleased with the "Portrait of a Gentleman," by James Howie. Surely they will, for though "this work does not contain much treatment," yet it is a "specimen of very true rendering without the aid of modelling the negative." Now, we Glasgow photographers hate modelling. They told Mr. Henderson, of Perth, a week or two ago, that they hated it. And so they may, for almost every one of them are slaves to retouching, or what is termed by a South of England photographer as "the Florentine system," which renders all freckles and imperfection in the skin imperceptible.

What became of our Lambertype, chromotype, and contotype friends? From the number of licensees in Scotland I expected to see any number of Lambertype enlargements by men who had seen the skilful M. Lambert touch up a negative; but I was disappointed. From this week's News I find that they do these things better in America. I was greatly surprised to see so long a letter in the *British Journal* by Mr. A. L. Henderson. It was not the bit about the hot weather of America I liked the best, nor the bit on carbon, but Jules Verne's "Round the world in eighty days," condensed by Mr. Henderson, is worthy of this special notice.

The enlargements exhibited by some of the Northerners had a tendency to flatness; the backgrounds too much the colour of slate. The artists in black and white over-do the thing. Like touching on the negative, this black-and-white fashion is being carried to an alarming extent. What will the Autotype Company say to this? Scotland is now in possession of two firms who do enlarging for the trade—G. W. Wilson and Co., of Aberdeen, and Annan and Skelton, of Glasgow. Both of these firms have on their staff men who were at Ealing De:n, certainly the best school. It was once supposed necessary to make arrangements with the Autotype Company for special licenses to do carbon work for the trade; but I suppose any one can enlarge for the trade now with impunity. One of your correspondents says openly that he is practising permanent printing, and that it is free. Surely I remember of the Company giving notice that they only supplied tissue to licensees. Am I right? These carbon patents were very loose from the first; and would it not be hard if the licensees were to find that they could not be protected? Chromotype is without doubt the process of the future; but there are many men thinking that if they could only get the tissue independent of the Autotype Company, permanent printing would have their immediate attention. Some pretty successful experiments at tissue-making have been tried about Glasgow. Messrs Sawyer and Bird will, no doubt, keep a sharp eye on Glasgow. I was surprised to see Mr. Ferranti speaking for the photographers of Edinburgh, or rather for Mr. Ayton. If they do not learn the chromotype process, and that very soon, where will they be? Let them answer for themselves.—Yours truly, Jo. VESTRIS.

ORIGIN OF PROTONITRATE DEVELOPMENT.

DEAR SIR,—I take the PHOTOGRAPHIC NEWS for the sake of *auld lang syne*; but I did not chance to see the numbers in June and July last until weeks after publication, and I was not a little surprised to find my name cropping up again in matters photographic. I am sure neither Mr. Spiller nor myself would wish to rob the introducer of the protonitrate developer of an atom of the merit. I must say, however, that Dr. Diamond seems (in his letter of June 30th, and again in his paper in the Year-Book) to be hitting rather hard at Mr. Spiller and myself, and in a way which I do not think we deserve

Mr. Spiller and I were dissatisfied (as most of those who tried it were—vide "Notes and Queries" 1853) with the unstable protonitrate made with baryta; and we tried to remedy that defect by other formulæ. I certainly did not know that all available nitrates had been tried. As no one else had published our methods, and as the solutions made by us would keep a considerable time, I maintain, in contradiction to Dr. Diamond, that we had reason for publishing (as improvements) the use of nitrates of lead and potash. Dr. Diamond's reasoning would bar all other experiments when he, "after innumerable experiments, has discovered the marvellously fine effects" of any chemical. As to the undoubted beauty resting with the baryta salt, I join issue with Dr. Diamond, and for the purpose of comparison will willingly forward you some positives, taken twenty-four years ago. I need not say that I should pay the carriage to you and back.

Before I possessed a camera, I had tried all the processes I could which I found in Mr. Hunt's book, and had read there something about protonitrate as a developer before I ever saw "Notes and Queries." My edition is the first preface, dated July 1851. Dr. Diamond's name does not occur in that edition, but in the same paragraph in which Mr. Hunt speaks of showing at York, in 1844, a series of photographs developed with protosulphate of iron, which salt he says "was most effective in developing any photographic images on whatever argentiferous preparation they may have been received." He goes on: "Mr. Robert Ellis has recommended the use of protonitrate of iron as a developing agent."

We were much indebted to Dr. Diamond for the trouble he took in rendering photography popular; but I do not think it is quite fair that he should come down so heavily on Mr. Spiller and myself because we had the misfortune to suggest the lead and potash formulæ. I can quite understand how Dr. Diamond's name was mentioned in the third edition. Mr. Home told Mr. Hunt that he understood protonitrate of iron answered equally well as the pyrogallie acid; and, probably, Dr. Diamond or Mr. Archer had told Mr. Home this (see page 146).

I ask you in fairness to insert this letter in your next number.—I am, dear sir, yours truly, J. LAWSON SISON.

Edingthorpe Rectory, North Walsham, Norwich.

[We have always pleasure in hearing from our old correspondent, the Rev. J. Lawson Sison; but we regret that it should be in connection with anything in which he should think he has received scant courtesy or justice. That no slight was intended by Dr. Diamond we could have declared unhesitatingly, and we are, indeed, authorized to assure Mr. Sison of that fact. Regarding the origin of the protonitrate developer, we accept Mr. Hunt's book as, probably, the best historic authority, and beg to refer our correspondent to page 264 of the third edition to which he refers, where he will find Mr. Hunt, after describing the beautiful results of the protonitrate developer as having "the air of a fine Daguerreotype, without any of the disadvantages arising from the reflection of light from a polished silver surface"; he proceeds: "For this beautiful result photography is indebted to Dr. Diamond, who is still pursuing the subject with much zeal." At what period Mr. Ellis proposed the protonitrate we have no means of determining; but his formula would practically have been prohibitory. It consists in adding sulphuret of iron to nitric acid, allowing the mixture to stand until the acid was saturated with iron, taking care to get rid of the sulphuretted hydrogen evolved; pouring off the liquid, filtering, boiling in a Florence flask to get rid of sulphur, and again filtering! Dr. Diamond's method, as is well known, is double decomposition with nitrate of baryta.—Ed.]

THE PROPOSED "PROGRESS" MEDAL.

DEAR SIR,—In the discussion on Tuesday evening on the subject of instituting a sort of "progress" medal for marked improvements in the science or art of photography,

I cited three instances which might possibly be taken as examples of what the council intended to do. The instances I selected were the award of a medal to M. Obernetter, for his elaboration of the powder process in multiplying negatives; to MM. Eder et Toth, for their investigations upon nitrate of lead as an intensifier; and to M. Rousselon, for his work connected with photo-gravure.

M. Warnerke met this statement by a direct contradiction, to the effect that medals were not given abroad for general progress, but only for the solution of some problem definitely set forth beforehand. As the matter was one practically outside discussion at the moment, I did not think it worth while to trouble the meeting with further remarks, but perhaps you will now permit me to affirm once more what I said. No one is better aware than myself of the practice that exists at Vienna and at Paris, to offer medals for the accomplishment of certain special work, and it is not three months ago that I myself urged M. Warnerke to claim an award, offered for the production of a supple and transparent film, by the Vienna Photographic Society. But the instances I took care to select differed from the above. No mention had been made by foreign societies of an intention to make an award for researches upon lead as an intensifier, or for a method of multiplication of negatives by the powder process, or for the special work which M. Rousselon has accomplished.—Faithfully yours, H. BADEN PRITCHARD.

*General Photographic Establishment, Royal Arsenal,
Woolwich, Feb. 14th.*

WATER FOR PHOTOGRAPHY.

MY DEAR SIR,—Will you allow me, through the medium of your valuable paper, to say a few words as regards water? Water, I may say, is the staff of life—only don't, reader, think I am a teetotaler by this expression. How useful it is to all, in whatever preparation they use it! How very useful for the tea-totaller in making his tea! (perhaps he does not drink tea; our courteous Editor can, perhaps, find out for me, as I am very anxious to know) But how useful to the photographer! Without it, where should we be? Well, we should be nowhere.

But to business. Distilled water is water which has been vaporized and condensed; by this process it is freed from impurities. Pure distilled water leaves no residue on evaporation, and it remains perfectly clear on addition of nitrate of silver, even when it is exposed to light. It should also be neutral to test-paper. Rain water has undergone a natural process of distillation, but generally contains a small portion of ammonia, obtained from the atmosphere, which, of course, gives an alkaline reaction to test-paper. It is first-rate for photographic purposes if collected in clean vessels, but should not be taken from common rain tanks.

Spring or river water contains sulphate of lime and chloride of sodium in greater or less quantity. On boiling it, it is generally purified water for nitrate bath. Common hard water can often be used when nothing better is at hand. The chlorides it contains are precipitated by nitrate of silver, leaving a small quantity of nitrates (soluble) in solution which are not injurious. Ordinary spring water does for the iron developer, except for the pyro acid one, which rapidly decomposes if hard water is used. The comparatively small amount of chlorides usually found in common water does not decompose much of the free nitrate in the exposed film, hence failure in the development from that source does not arise, except to a very limited extent.—Yours, very truly,

Grafton Underwood, Kettering. O. R. P. VERNON.

P.S.—Now we are on the subject of nitrate of silver, I have a formulæ for nitrate bath which I obtained of Mr. Edwards. My time being completed, I am at liberty to give it. Words cannot speak high enough of it, but it is too long to give in this letter, therefore if any reader likes to know about, he shall have it on application.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE Annual Meeting of this Society was held on the evening of Tuesday, February 13th, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meetings were read and confirmed, after which Scrutineers to examine the voting papers were appointed.

Captain ABNEY wished to state that his nomination to the office of president had been made without his knowledge or consent, and if elected he did not wish to accept the office.

The Scrutineers retired to examine the papers, and at a subsequent period of the evening made the following return:—

President.—J. Glaisher, F.R.S.

Vice-president.—Captain Abney, F.R.S.

Treasurer.—J. Spiller, F.C.S.

Council.—F. Bedford, W. Bird, J. Hughes, R. W. Thomas, H. P. Robinson, J. T. Taylor, and W. Mayland.

THE SECRETARY read the report of the Council, which was received and adopted.

THE TREASURER then read his financial statement, from which it appeared that the balance in hand amounted to £253 5s. 9½d.; the balance in favour of the Society, including assets, was £406 12s. 11½d. Referring to the falling off in the returns of the exhibition, Mr. Thomas pointed out that other exhibitions of the same year had been equally unsuccessful, and that from various causes. The political excitement was to some extent answerable, especially as it filled the daily papers, and to that course he attributed the absence of notices of the exhibition, which always affected their success.

THE CHAIRMAN, in highly eulogistic terms, proposed a vote of thanks to Mr. Thomas for his able services as treasurer, and for his energetic efforts on behalf of the Society's interests generally, to which they were indebted for the privilege of holding their meetings in that room. The motion was passed by acclamation. After an acknowledgment from Mr. Thomas,

THE CHAIRMAN proposed a vote of thanks to Mr. Friswell, their late honorary secretary, which was duly passed and acknowledged.

Captain ABNEY thought it would be for the advantage of the Society, and of the art generally, if the system were revived of giving a medal of honour to persons who should, either in connection with the art or science of photography, make the greatest step in advance. Such a course was followed by other learned societies, and he thought that such a plan provided a valuable stimulus to effort. Such a medal to be awarded by the council with, at least, a three-quarter majority.

Mr. SPILLER seconded the proposition.

Mr. KENNETT begged to support the motion.

Mr. J. R. SAWYER wanted to know, as the council would award such medal, in what manner members of the Society would gain assurance of the worth of the advance made, and the worthiness of the recipient; because he thought that the award of such a medal, to have any value should not admit of doubt or question. He apprehended it would be rather for scientific discovery, than merely for personal work produced, and would be for new ground broken, rather than for simple improvement.

Mr. H. B. PRITCHARD mentioned that such a plan was at present pursued by continental societies. The French Society recently gave a medal to Mons. Rousselon for a system of photography. In the German Society Messrs. Eder and Toth had recently received a medal; and last year M. Obernetter received a medal for the powder process.

Herr WARNERKE said that, as a rule, foreign societies gave medals for a special discovery or improvement previously announced as open to competition.

Mr. YORK thought the plan of offering a medal for a specific discovery was a good one; and might be with advantage adopted. The subject of pinholes, for instance, might well be investigated. All were familiar enough with the deposit which caused the pinholes; but no one seemed certain of its nature or constitution, or cause. He would undertake to supply the material, if the Society would have it, properly analysed.

Mr. SPILLER said he had that subject under examination to bring before the next meeting, and would be glad to accept some of the deposit from Mr. York.

Captain Abney's motion was eventually carried unanimously.

Mr. H. B. PRITCHARD then read a paper on "Photography from a Holiday-maker's Point of View." He exhibited his small camera

and dark slide, and a stand which formed a serviceable Alpine stock. He also showed some fine examples of photography produced with the slight impedimenta which could be carried during a pedestrian tour.

Herr WARNERKE, referring to the sensitive films which Mr. Pritchard had used, wished to mention a facility to the traveller which these films presented. A gentleman who had recently started for Africa had taken a stock of them and a camera. He knew nothing whatever of photography, but was instructed how to select and focus a view. A few days ago he received, from Cairo, a small post parcel, with a stamp of one piastre, equivalent, he thought, to about twopence-halfpenny. This parcel contained half a dozen film negatives for development. He had developed them, and now showed them to members.

After some further conversation, a vote of thanks to Mr. Pritchard and to Herr Warnerke was passed.

Captain ABNEY exhibited to members some examples of the instability of aniline dyes. Pieces of paper, dipped in the dyes, were cut in two, and one-half exposed to light for a month, whilst the other half was protected. Many of the tints were entirely changed.

A conversation followed on the affinity of aniline dyes for animal substances.

THE CHAIRMAN announced that at the next meeting the subject for discussion would be the silver bath, and Mr. Spiller would bring the subject before the meeting.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting was held in the Hall, 5, St. Andrew Square, on the evening of Wednesday, the 7th inst. There was a very large attendance, and the chair was occupied by JOHN LESSELS, Esq., President.

The minutes of the last ordinary meeting were read and approved, and the following gentlemen were admitted ordinary members: Messrs. Edwin Smithells, David Gregg, Robert R. Raeburn, M. M. Scott, H. C. Peacock, G. B. Rodger, James Abbot, Archibald Downie, J. Adamson, Andrew Pringle, Andrew Dewar, P. S. Smith, J. Forrester, J. Simpson, W. H. Cunningham, and J. Forbes.

Mr. NORMAN MACBETH, A.R.S.A., one of the judges at the late Exhibition, read a paper on "The Works of Karelina, and what may be gathered from them" (see page 74).

Mr. TUNNY congratulated Mr. Macbeth on the exceedingly interesting paper which had just been read. It showed that a very large amount of attention had been given to the works in question, and he (Mr. Tunny) thought them quite worthy of it. Karelina was a thorough master in his art, and well deserved the high recognition (the gold medal) that he had got. He could not, however, agree with Mr. Macbeth in his observations regarding art. Fine art is not a thing of paint and brushes, neither is photography an outcome of camera and lens. In both cases they are the mere tools guided and directed by a trained and cultivated brain. A true artist, whether he is the one or the other, will put his mind into his work, and stamp it with his own individuality. With reference to the prize picture, which had already been the object of considerable discussion, and puzzled not a few as to how the effects had been produced, his opinion was different from that of Mr. Macbeth. He did not think it was taken in direct sunlight, as, in that case, the shadows would have been much deeper. The light, he thought, did not come by the window that was shown in the picture, but from a point above it, and both in front and behind the curtains. On the whole, the picture was, in his opinion, not nearly so simple as Mr. Macbeth thought, and many of the lights had been put in; and some of the shadows, particularly those on the dress of the lady, were the result of sunning after printing. With a view to test his opinions on the subject, he had, a day or two ago, from memory, tried to reproduce the composition and effects in his studio, which he had arranged for the purpose, and begged to submit the result for examination to the members. With him it was not a question of how a picture was produced, but what is the character of the production, and he had no hesitation in saying that, in his opinion, after much careful study of the works in the late Exhibition, Mr. Karelina stands unrivalled and alone.

Mr. BASHFORD also complimented Mr. Macbeth highly, and said that his paper was more valuable than anything he had ever read in connection with photography. Mr. Macbeth had not only pointed out the merits of the picture, but had given the reason why it was to be admired. He had never seen so much useful information given in so small a space. He agreed with Mr. Mac-

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both on the whole, and especially in that, that the operator who arranges that which he wants, agreed with Mr. Macbeth in what might fairly be called the simple work of the camera. He (Mr. Macbeth) leave all defects that might be there; but that was really too far. His opinion was that the photographer should be getting as perfect a photograph as possible, and then use either the pencil or the brush, or both combined, where by such means the work can be aided or improved. He heartily thanked Mr. Macbeth for the lessons in composition, and the many lessons on other matters that he had given the members.

Mr. TURNBULL said there was undoubted evidence of much work of both pencil and brush, as well as of shading, on the prize picture; but the works of the distinguished foreigner were no doubt very grand, and everybody might learn something from them.

Mr. DAVIES said the Society was much indebted to Mr. Macbeth for the great trouble, not on this occasion only, but frequently before, in educating the members. He heartily concurred in all that had been said in favour of Mr. Kareline's works, and suggested that the picture "Blind Man's Buff" would throw some light on how the prize picture, as well as many others equally puzzling, were produced. The window in the background of the "Blind Man's Buff" picture was the other side of the window in the prize picture, and he had no doubt that it was simply a "property" that might be placed wherever it was wanted.

Mr. ASHER spoke highly in favour of Kareline's works, and took some credit to himself for having picked out his works in the Paris Exhibition of last year. On referring to his note-book he found that he had thought them the very best there. In his opinion the prize picture was an enlargement from a smaller negative.

Mr. BOW agreed with Mr. Macbeth in his admiration of Kareline's works, but not that the prize picture was the best. The portrait of Kareline himself was, he thought, finer. He thought, also, that Mr. Macbeth was wrong in condemning finish. An unskilful attempt to finish a photograph was doubtless objectionable; but when skill and finish go together, there should be no limit to it.

Mr. FAWCETT thought the prize picture had been printed from two negatives, and that there had been much retouching and shading; but both were admirably managed.

Mr. VALENTINE, of Dundee, regretted that the distance from Edinburgh prevented his giving the Exhibition as much attention as he would have liked. He could not understand why the gold medal had been given to the picture principally under discussion, and thought many of the works of the same artist were much better. He had no doubt that Kareline used reflectors very freely, especially in such compositions as that of the prize picture. Regarding the question of photography as an art, he would say that into whatever work artistic feeling was brought, that was an art; and it was well known that the feeling of the man could be and was brought into the work of the camera. Many years since, he was able to pick out the works of Mr. Rodger, of St. Andrew's, from any number of pictures by other photographers, and that simply because there was something belonging to the artist himself infused into every picture that he made.

Mr. MACBETH, in reply, said that he was sure no one would charge him with a desire to trample on anybody's toes; his only aim was to conscientiously do what was right. Photography was not really a representative art. It missed the cultivation of the eye in acquiring correct notions of form and shape. It simply realises what is presented to it, and has no aim beyond realization. Keeping this in view, however, he had no hesitation in saying that photography was a power in art; and he did not think anyone at the present time would be found to defend the stupid ignorant prejudice that some artists had at one time shown against photography.

Mr. PANTON moved a hearty vote of thanks to Mr. Macbeth, which was passed by acclamation, and said that he had bought the portrait of Kareline for the purpose of presenting it to the Society, which he now begged to do, and for which he received a vote of thanks.

The PRESIDENT laid on the table a number of very fine large views by Mr. Valentine, of Dundee, which that gentleman wished to present to the members of the exhibition committee, as a small acknowledgment for the pleasure he had derived from the result of their labours; and accorded him a vote of thanks for his liberality.

In acknowledging the vote of thanks, Mr. Valentine said that

Knowledge of Photography.—It is a pity that better observations are not made between the photographer and the public. A more ready knowledge of the art would be of great benefit to both parties.

Mr. LEBWELL said that he had seen the prize picture, and that it was a very fine work. He thought that the photographer should be getting as perfect a photograph as possible, and then use either the pencil or the brush, or both combined, where by such means the work can be aided or improved. He heartily thanked Mr. Macbeth for the lessons in composition, and the many lessons on other matters that he had given the members.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of the Association was held on Wednesday, the 7th inst., at the Museum and Library, Road, Bristol, Mr. W. W. STODDART, F.C.S., F.G.S., President, in the chair.

The minutes of the previous meeting having been read and confirmed, Dr. Thompson and Mr. Pusey, both of Bristol, were elected ordinary members of the Association.

Mr. W. W. STODDART then gave an address entitled "Notes on Photographic Chemicals, and their Adulteration" (in our next), after which a general discussion took place. The address was fully illustrated by specimens and experiments, and the meeting terminated with a cordial vote of thanks to the President for his address, proposed by Mr. H. A. H. DANIEL, and seconded by Mr. G. WEBBER.

Talk in the Studio.

COLOURED ENLARGEMENTS ON PORCELAIN.—We have been favoured by Mr. Alfred Harman with a sight of a couple of very charming portraits which he had exhibited at the late Exhibition in Edinburgh. They consisted of enlargements from small negatives, and printed on porcelain or opal glass. The photographs were manifestly finely modelled, and both delicate and rich in tone, rendering them especially suitable for the water-colour finish of the miniature painter. These were admirably painted in water colour, the delicate flesh tints of children being perfectly rendered without any trace of the heavy, opaque, black shadows too common in coloured photographs.

PHOTOGRAPHS OF THE POPE AND CARDINALS.—We learn from the Tablet: "A very large painting representing Pius IX., with all the Cardinals and chief officers of the Vatican, is about to be executed under the auspices of Mr. John Eastham, of Manchester, and his nephew Mr. George Cooper, of Hull. These gentlemen are in Rome, taking photographic likenesses of the Holy Father, the Cardinals, the Major-domo and Master of the Chamber, Monsignors Howard and Stoner, and other ecclesiastics attached to the Vatican. They will visit Paris, Vienna, New York, Dublin, and other places, to take the likenesses of living Cardinals, and from these photographs an immense picture is to be painted by Mr. Crozier Harrison. The expense will amount to many thousands of pounds. While in Rome, Messrs. Eastham and Cooper have taken photographs of the paintings in San Clemente, and of some of the portraits in the English College. They have also photographed the rector and students of the English College, and of the American and other colleges in Rome. They have

obtained also the autographs of the Pope, the Cardinals, and many distinguished persons. They have photographed Sir A. Paget and the officials of the British Embassy, in Rome." Another issue of the same paper says:—"On Friday, the 26th of January, the Holy Father sat for his portrait to Mr. Eastham, of Manchester, and Mr. George Cooper, of Hull, the photographer to the Prince of Wales. The negatives were taken in the Pope's private library, in presence of Cardinal Monaco La Valletta, Mgr. Ricci, and other members of the Court. Usually great difficulty is experienced by photographers when taking the portraits of gentlemen aged over seventy. The Pope, however, although aged eighty-five years, remained perfectly steady for more than sixty seconds in the positions assigned him by the photographers. He showed not the slightest weakness of nerve or unsteadiness of muscle during the sitting."

PHOTOGRAPHIC JOKE IN CONNECTION WITH THE CONFERENCE.—The *Standard* Correspondent says that the representatives of the Powers went the other day to the studio of Abdullah to be photographed in a group. When they were posed, the operator said to them, in French, "Don't move, gentlemen, don't move." "Parbleu!" said the Count de Chaudordy, "you may say that to the general, but the rest of us are quiet enough, I assure you." Some minutes elapsed before the countenances of the delegates were sufficiently composed for the photograph to be taken. The Italian residents say of the Plenipotentiaries:—

"Sono arrivati come leoni,
Partono come cagnoli."

Among the English it has been proposed that a prayer should be put up in the English churches "for some persons who are at sea." And when, the other day, some one expressed a wish that before their departure the representatives of the Powers would lay their heads together for the purpose of obtaining a better pavement for the Grand Rue of Paris, the immediate reply was that a wooden pavement would not be suitable.

AN OPERATOR'S SALARY.—Jules Guggenbeim, described as a photographer of High Street, was summoned by Henry Fensland, an operator, who had been in his employ, for non-payment of £2 12s. balance of wages. The summons stated that defendant had employed complainant on the 6th of December at a weekly wage of £2. On January 20th complainant left him. During that time he received £11 on account, leaving the balance claimed. Defendant pleaded that complainant had never fulfilled the engagement, which he did not deny having entered into with him. Complainant deposed that he entered the service of defendant on the 6th of December last. He produced the letter requesting him to come a month on trial as operator, at a wage of £2 per week. On the first Saturday after he came he received his wages for the three days, and his expenses. On the following week witness was paid £1 10s., defendant saying that he had not enough money by him to pay the whole. On the following week £1 was paid him, and the next week 15s., the same excuse being given. This system continued till he left defendant's service, when the total balance owing to him was £2 12s. He had never heard any complaint as to the manner in which he did his work. Defendant declared that complainant was not able to do his work, and that on the last day he agreed to come on the following week at half price, but he did not do so. Complainant admitted having made this agreement, but stated that he was engaged as an operator, and the work complained of, which defendant alleged he was unable to execute, was new work, altogether apart from the duties of an operator. Notwithstanding this fact, he entered into the agreement, which he afterwards refused to carry out, acting on the advice of his father. Defendant alleged that he complained daily of the manner in which complainant executed his work, and also of a number of articles which were broken, as he believed, by defendant. These articles included five or six glass tunnels, a focussing glass, worth 25s., and a host of other articles; in fact, it was "break, break; broke, broke." Complainant denied breaking the tunnels, and also stated that the focussing glass was in a proper condition when he left defendant's employ. Defendant here asked complainant whether he did not tell the servant girl, in a dark room, that there was no God nor devil in this world; but the question was ruled to be irrelevant. Complainant further stated that directly he left his situation

he received an insolent message from defendant, to the effect that a quantity of chemicals were missing. The Bench expressed regret that defendant had been so foolish as to put himself to all this expense. Complainant had earned his money, and must be paid, and he would leave the court with a character unimpaired. Defendant was ordered to pay the amount, and also the costs.—*Oxford Times*.

DALLASTYPE.—the *Paper and Printing Trades Journal* states that "The *Journal für Buchdruckerkunst* attributes to Preuss the photo galvanic process known as Dallastype. It published 20 years ago photo-electrotypes on engravings prepared by Preuss."

To Correspondents.

R. LAMBERT.—Mixing preparations of oxalic acid, or chloride of lime, in the same room where a vessel containing a solution of nitrate of silver was standing, ought not injuriously to affect the latter. Any contamination caused by the fumes of chlorine would be manifest in the form of chloride of silver, which would have been visible to the eye.

BACON.—As a rule, the price of nitrate of silver is without change and fluctuation is not a normal thing. We cannot tell the reason for its recent sudden rise to 3s. 11d. per ounce. Indeed, we were not aware of the fact. It certainly seems, as you suggest, another illustration of the instability of silver!

J. S. C.—The registration of a photograph is effected at Stationers' Hall by giving, on a form prescribed for the purpose, a description of the picture, with the name of the owner of the copyright, &c., and the payment of one shilling. The form can be obtained at Stationers' Hall for one penny, by personal application, but no business is done there by correspondence. To meet this difficulty for country readers, our Publisher will attend to the matter if you forward him particulars and eightpence in stamps. 2. There is a little smoke produced by the combustion of the mixture you mention.

ENQUIRER.—The kind of background necessary in a studio depends much upon the taste of the portraitist. Two plain ones of grey, dark and light, are all that are necessary; but various others may be used with advantage. For vignettes a light background is necessary. 2. The grained texture to which you refer is produced by double printing, a second negative with a suitable grain being used after the portrait is printed. The grained negative may be obtained by photographing a piece of rough drawing paper, or a piece of Turkey morocco leather. 3. We prefer white blinds. 4. We cannot recommend any special lenses by name in this column. You will find details in our advertising columns; or if you send a list with a number or letter attached to each, we can then indicate which is best suited for your purpose.

X. Y. Z.—We do not see any advantage in permanently blocking out any light. We should obstruct it where it was not required. 2. The curtain we should prefer with rings, to slide on a rod. 3. Bigelow's system seems well adapted for readily securing varied effects in lighting.

H. PARSONS.—The Secretary to the English Commissioners of the Paris Exhibition of 1876 is, we believe, Mr. Cunliffe Owen. We have not seen any announcement of the offices of the English Commissioners yet; but a letter addressed to Mr. Cunliffe Owen, at the South Kensington Museum, would probably reach him.

W. B.—We have no doubt that most of the professional enlarger will produce you work on rough drawing paper, which will permit finishing in crayons.

J. L. S.—M. Constant died early in the summer of last year. In him photography lost a valuable and careful experimentalist, and we lost an esteemed friend and contributor.

KINGSTON.—The dry plates you mention do not require a long exposure. try two or three times as long as for wet plates. You will find full instructions for alkaline development, which they require, in our YEAR-BOOK just issued, on page 126. By managing the development you can correct over-exposure if the plate show symptoms of the exposure having been longer than necessary.

B. L. D.—There can be no legitimate doubt that a good carbon print is permanent. The facts which you mention to the contrary are not evidence of any want of permanency; they simply show that such a picture is not indestructible. The best picture of any kind which can be produced can be destroyed if subjected to unfair conditions. An oil painting or an enamel can be destroyed. An oil painting would blister if placed for months in hot sunshine. We cannot precisely define for you what is included in the respective licenses granted by the Autotype Company; but they will doubtless do so if you apply to them.

Several Correspondents in our next.

The Photographic News, February 23, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY VERSUS ENGRAVING.—THE SCIENTIFIC KNOWLEDGE OF PHOTOGRAPHERS.—HOW TO MAKE SHELLAC VARNISH.

Photography versus Engraving.—When will painters in this country begin fully to understand the advantages photography has conferred upon them? In France and Germany artists have been for some time past alive to their interests by employing the camera, instead of the engraver, to copy their paintings; but here in Great Britain it was but the other day that leave was obtained to photograph and publish some of the paintings in the Royal Academy. British painters allow themselves to be plagued by pirates, and are for ever proceeding against those who get money by surreptitiously copying their works; yet it seems, so far, never to have occurred to painters in England to take the matter into their own hands, and make profits for themselves. In Berlin, as also in that headquarter for art, Munich, very large sums are paid for photographs—*a silver even*—of paintings; thirty and forty shillings being no unusual price to ask for large unmounted copies of paintings. The firm of Goupil et Cie., of Amsterdam, which employs (for its smaller work, at any rate) the Woodburytype process, or, as it is there termed, the photoglyptique method, also does a most extensive business in copying artists' pictures, and selling the prints at a high figure. Twenty and thirty francs is a common figure for twelve and fifteen inch pictures by good painters, and when it is borne in mind how little such copies cost to print and produce, it is evident a large surplus remains for the artist or owner of the copyright. A twelve-inch photograph mounted cannot cost more than a few pence to produce, and therefore the public are asked thirty or forty times the outlay that is made. It is only the other day that we saw in London a photograph of this size—framed, it is true, but very simply indeed—marked at thirty shillings, and we have reason to believe that a large number of such pictures are sold. It was one of Goupil's reproductions, and the work of a modern French artist. If we set the latter's royalty at ten shillings—and it is probably more, than less—an edition of four or five hundred would realize a couple of hundred pounds, while there is no reason why, with agents at the various capitals, a popular picture might not be sold in some thousands. There is no costly outlay for engraving, and if the tints are only suitable for photography, a far truer reflection of the artist's original work is presented if photography is employed in its vulgarisation. Gentlemen interested in art, after a visit to the French or German capitals, generally come back now-a-days with a glaring account of foreign photography, and declare that in Great Britain there are none to compare with the photographers abroad in regard to the skill and intelligence employed in copying pictures. Visitors will bring back with them a dozen such photographic sketches, because there is nothing of the kind to be purchased in this country. In this, however, like most hasty people, they mistake cause for effect. Our photographs would be quite as clear as their foreign brethren in such work if they only had it to do. The most successful by far of all who have tried their hands at the delicate operation of copying paintings by photography was Mr. Bingham, who went over to Paris simply because there was no work of the kind for him to do in England; and his firm is, we believe, still the most noted in the French capital for producing prints of this nature. By reason of the large amount of work done in this way at Paris, Berlin, Vienna, Munich, &c., there cannot be a doubt that it must be lucrative to the artists, and for this reason we commend British artists to tarry no longer, but to follow the example of their other brethren in Europe. It is only a very fine picture indeed that will bear the cost of engraving, but any happy sketch might be photographed to the profit of its author, who would not only gain money, but reputation too, by the copying of his work.

The Scientific Knowledge of Photographers.—It is a pity photographers are not better chemists; they would then be able to discern much better between profitable and unprofitable investigations. Many a weary hour or day is spent in trying to bring about certain changes, which a more ready knowledge of chemistry would have shown them could be effected in the simplest manner, or have told them was, perhaps, impossible. Many who are thus ignorant have very curious ideas about analysis. If they want to know all about a thing, it is only necessary, they imagine, to ask a chemist to go through the form of "analysing," and it is done. You put the substance, as it were, into a machine, turn the handle, and the products fall down through the outlet pipe. Nothing is too abstruse to get at. You must inevitably find out all about a thing directly you analyse it. We remember, some years ago, a gentleman in a great state of mind rising at one of the meetings of the Photographic Society, and, with a display of temper, telling the members that it was really pitiable photographers did not, as yet, know how silver prints could be produced of a permanent character. "For goodness' sake, let us have a commission, and find out how to secure durable silver prints," said he, "if we do not know the way to do so at present!" It only wanted a commission to do it, he thought, and then the whole vexatious business would be at an end, at once and for ever. He would have treated the moon in the same way, probably, and asked to have that analysed if it had worried him. Indeed, there is nothing that a chemist cannot do, in the opinion of some people. The scientific man has only to be employed upon a problem, and it is solved that instant. They don't know how he goes about it, nor do they wish to be informed, for they prefer the whole matter to be shrouded in mystery. They can then believe in it, heart and soul. They don't understand such things, they tell you, and they cannot begin now. When people talk like this, we always think of a popular definition of science we once heard. Science, to the general public, is anything you can't comprehend; directly you begin to understand it, it ceases to be science. So it is with the photographers to whom we allude, and some—even of the cleverest—would be as much taken aback to learn that they are really acquainted with a good deal of elementary science, and have to bring scientific principles to bear whenever their bath, or developer, or printing goes wrong, as the *Bourgeois Gentilhomme* was, when he was told that he had been speaking prose all his life.

How to Make Shellac Varnish.—Some experiments have recently been made by M. Pelts on dissolving shellac in alcohol. The reason why a turbid liquid is usually the result is because the shellac contains about four per cent. of fatty ink, or any substance which remains in suspension. M. Pelts suggests the addition to the solution of powdered chalk, for in this way a liquid is secured which is three-fourths clear, whilst the lower portion can be rapidly filtered. If prepared on a large scale, the shellac varnish thus prepared may be filtered through felt. Another method of preparing shellac solution is to add to it, for every three parts of solution, one part of petroleum-ether. In this way two layers of solution are secured, the upper and lighter coloured layer containing the petroleum-ether with the wax dissolved in it. Instead of petroleum-ether, ordinary benzole may be employed, when the same results will be furnished.

M. LAMBERT'S INSTRUCTIONS FOR CARBON PRINTING.

In the midst of the discussions which were raised as to the claims of M. Lambert in connection with the processes associated with his name, for the most part the subject of patent protection, no question was ever raised as to the great skill and capacity of M. Lambert personally, or that his mode of working the carbon process was singularly successful and satisfactory in result. Whilst he protected

his improvements by the aid of the patent law, he was no monopolist of his knowledge gained by experience. One of our American contemporaries who is in antagonism with Mr. Lambert recently published his instructions to pupils and licensees, and for the benefit of the general reader. M. Lambert, referring to this publication, endorsed the instructions as quite correctly given. The patented processes are of course only available to licensees; but much of his experience will be found of value to all carbon experimentalists. We shall therefore make some extracts from these instructions. Here are his instructions for carbon manipulation in producing what he terms *chromotypes*.

"Sensitize the purple chromotype tissue in a solution of bichromate of potash, half an ounce to fifteen ounces of water, with five drops of ammonia to the pint; but in hot weather use a weaker solution and less ammonia. In very hot days put ice in or under your bath, and dry the tissue in a cold draught; and as soon as dry enough not to be tacky, roll the tissue and put it in a tin box. Sensitize for two minutes in summer and three minutes in winter. Use the Lambert photometer to print portraits and transparencies, and the actinometer to print the borders.

"We find, on visiting our licensees' studios, that there are here a great variety of bichromate of potash, all having different strength. With the majority of them $1\frac{1}{2}$ to 2 ounces B. P. to 100 ounces of water works the best. We advise you to try different baths of different strength with the bichromate of potash you use, and adopt the best adapted to your negatives. *Too strong a bath will give you reticulations, whilst a bath too weak will give you no half-tones.* A strong bath is better adapted for strong negatives, and a weak bath is preferable to print from weak negatives.

"If your tissue is too soluble, thus losing half tones in development, which is too rapid, sensitize a few days before using, keeping the tissue in tin box. The more ammonia you put in your sensitizing bath the quicker the printing, but slower the development. If the tissue is dried too quick, it is more soluble; if dried too slow, it is more insoluble. We advise you to heat your room where you dry the tissue, if it is either damp or cold; a current of air is very good to dry the tissue.

"Prepare your opal or plain glass by rubbing on it a solution of five grains of wax to the ounce of benzole; then take off the excess by rubbing with flannel, and polish with a clean flannel. Collodionize with collodion (ether six ounces, alcohol six ounces, and one drachm of pyroxyline). As soon as evaporated, immerse in water until the water runs evenly on it. These plates can be kept in water any length of time. Place the pieces of tissue, after immersion in cold water, on the plates thus prepared; after throwing a little water on, cover with the india-rubber cloth, squeegee, and put under pressure between blotting-paper for about ten minutes. Squeegee smoothly at first, then heavily, taking care not to stop or begin on the print.

"Develop in a flat dish. When you see the powder dissolving on the edges, pull the paper off, taking care not to touch the collodion; then put in a perpendicular grooved bath, at a temperature of from 85° to 100° Fahr. It is advisable, after development, to immerse in alum water (water two quarts, alum a handful) to render the gelatine insoluble. Wash, dry, and then spread on the transfer paper previously soaked in warm water. While yet damp mount on cardboard with starch paste, and as soon as dry pull off from the glass and cut them ready to deliver. We do not recommend this method of mounting unless a very bright gloss is required.

"The best way to mount the prints is to lift them up from the glass, when dry, under water. Cut them, and mount with starch as for silver prints; then burnish. This is the easiest way, and gives a finer gloss.

TRANSPARENCIES, ETC.

"Albumenize (as for negatives) instead of waxing your plates for transparencies, then collodionize; the prints will stick better to the glass.

"Do not float, but immerse, the tissue in the sensitizing bath from two to three minutes. As soon as you see the edges of the tissue turn up, it is well sensitized. Pass a very fine sponge on the face of the tissue so as to prevent air-bubbles, and rub off the whitish powder of paper usually adhering to it.

"When the paper is hard and rolled, roll it from one end to the other, under the solution, and *vice versa*, so that the solution touches every part of the tissue, until it gets flat. Never touch sensitized paper when dry, or it will produce stains; never touch, neither, the face of any unsensitized tissue when dry.

"Never use the same sensitizing solution over two or three times. The tissue when wet is not sensitive, so fear no light. Dry your tissue, if possible, in a room not too warm and not too damp, as it must not be damp or horny when used. A room where there is no draught is the best adapted to dry the paper. The drier the paper, the less sensitive: the damper, the more sensitive; but when wet, it is not sensitive at all.

"Only sensitize the paper a few days before being used, as after a time sensitized paper is neither quite so soluble nor so sensitive, and requires a little longer exposure and development in hot and dry days; but in winter and damp weather it is the contrary, the paper becoming more sensitive on account of the dampness of the air, but in winter you can use paper one week to twelve days old. Place a glass rod on the front edge of the sensitizing dish, over which draw the surface and back of the tissue upon removal from the liquid, to take off all excesses, and have an even surface. Always use pure yellow bees'-wax, not the prepared white kind sold by chemists.

"After coating your plate, rub repeatedly (first on the length, then on the breadth of the glass) with a tuft of papier Joseph (better from being used a few times; other substances, in absorbing the wax, will make the prints stick to the glass) until the benzole is completely evaporated, which you will perceive by feeling a resistance. No other pressure than the weight of the arm must be used with the papier Joseph, which can be used indefinitely. Then take off the excess of wax by rubbing heavily with a piece of flannel (which you can use indefinitely), and then polish with a clean piece of flannel, which you keep for that purpose. If the plate is properly waxed, it will have, by reflection, a veiled appearance, and if rubbed with the finger will give a resistance and grating noise. In very hot days do not rub too hard with flannel, as the wax, being soft, might come off. Should the operation not be done properly, you will meet with the following accidents:—The print will not adhere to the glass if the excess of wax has not properly been taken off with flannel; the print will stick to the glass if not enough wax has been put on it, or if too much has been rubbed off.

"After collodionizing the glasses (any good plain collodion will do), let them dry for about three minutes; then put them in cold water until there are no greasy lines seen on them. In cold weather, do not use the water too cold, as the film would have a tendency to peel off. Always use faultless glass, and in preference pot-metal opal glass. Roughen the edges of these glasses, or the collodion might slip off from them in washing. If you use common glass instead of opal, the collodion film might slip from the plate when placed in water, unless the edges have been well roughened.

(To be continued.)

MR. KARELINE'S WORKS, AND WHAT MAY BE GATHERED FROM THEM.

BY NORMAN MACBETH, A.R.S.A.*

ALTHOUGH the photographer can never lay claim to any merit in the formative part of his work by drawing, and certain other high departments of fine art, which are a

necessary concomitant of the painter, who has to represent his own individual impressions of character—to invent a style and produce qualities of texture and colour unlike nature in fact, and at the same time be charmingly like in appearance (some comparisons are odious, and such work as we have now indicated should never enter into comparison with photographic work proper, which, in that department, has no art in it, being purely a reflection through the lens), yet who does not see what a boon it is, to every student of art as well as of nature, to have in our hands such perfect translation of facts as we have had presented to our notice so recently? However, there are corruptions in every art, and nothing is so much to be deplored in photography as the now too common habit of working on the negative, destroying surfaces, and thereby losing all that is so real and authentic.

I fear, however, it is hopeless to expect any renunciation of working on the negative so long as the development of the highest lights, and in particular of skin, is not better manifested than it is at present. It is in the department of light and half-light (the latter being the region of colour) where the development comes most short.

I have no objection to any amount of skill or art being rendered on a positive, if people will prefer them, but let them be classed as what they really become—photographic art-miniatures. I maintain that it shows a weakness in the photographer when he has recourse to this practice with a view to make up deficiencies which both he and the public are fully conscious of. It is the apparent absence of this in Mr. Kareline's work which forces me to acknowledge the superiority of his productions, fully demonstrating that the faintest light lying in the deepest shade may be secured, while, at the same time, the highest lights, even in sunlight, are kept free from solarization, and are consequently vigorous.

I should like to have dwelt longer on this topic, as one of the things in particular from which we may gather much, as expounded by the works of Mr. Kareline. Suffice it to say that the danger into which many photographers run appears to me to be the notion that strong relief is of the highest and only excellence; and, either unconsciously or through inexperience, the tendency, by modelling on the negative, is to go to excess with it, changing the natural moisture of the skin into the appearance of the sitter's face having been oiled, or producing the appearance of a white porcelain surface, giving no representation of the individual's complexion.

It is a complete fallacy to suppose that such work, seeing that at its best it is but mongrel in character, will ever attain to be classed as high art. Fine it is, if mere minuteness be considered of the right kind. It is not in that sense, however, that fine art is to be considered, for in painting—as a representative art—mere fineness is not regarded as good art, but rather otherwise—as poor and vulgar; and, on the other hand, roughness, the other extreme, is not regarded as of itself an excellence. It is the amount of truth which is imagined by surface-rendering, and the extent to which it is suggestive, which constitutes the excellence of such manipulation; and if that be difficult in large work with the painter, how much more difficult and precarious must it be for the photographer, who attempts such expressive work on surfaces much more minute! Photographic work in itself is not representative: it is the most positively realistic manifestation of a pure reflection, and should infallibly present nothing beyond what is before the instrument, except what may be treated by light on the positive. It will take some time before the public will see the importance and force of this; but it is the duty of every photographer to pursue the most legitimate methods of production which are in strict accordance with its own scientific bearing; for, rest assured, the more perfect a transcript of nature can be made through photography—i.e., by light and chemical development, without extraneous aid—the

more will it be confided in as an auxiliary to art, and be highly prized under any circumstances, but more especially when parties who have been photographed shall have ceased to live.

Having thus analyzed and pointed out the merits of Mr. Kareline's prize work, I shall now rapidly glance at some of the rest of his works, differing from this in character. Mr. Kareline forwarded above twenty separate frames, besides two portfolios containing smaller works, all giving full scope of judging his general capabilities as a photographer. His "Portrait of Platonoff" (No. 776) is, perhaps, the best specimen of portraiture proper which he has sent to the Exhibition. The subject is not placed in sunlight. The white dress is managed with much breadth of effect, the position is simple but vigorous in action, the character strong and well sustained, and the tone of the flesh (especially in the arms) is finely realised, and that, I have no doubt, through much judgment. This, of all his works, is the least photographic in appearance. The accessories are very simple, and the aspect of the portrait is altogether not unlike those by Sir Joshua Reynolds.

I have already made reference to Mr. Kareline's own portrait (No. 800). It was taken in the open air, in sunlight. He is standing with a sketch-book in hand, looking for an idea. He has on a black felt hat, which casts a broad shadow over the face. A plaid over the right shoulder is relieved by the shadow of some dark space, like a door, while the black hat is relieved by a wall of broken plaster in sunlight. I should have liked this head to have been a little farther up in the light, preventing the lateral line of the door from affecting the repose of the head. This is one of the things which I humbly think Mr. Kareline should guard against, for apparently in several of his works extraneous objects of no important bearing on the subject are permitted to molest much beauty. For instance, in a place in one of his pictures, where a party play at blindman's buff, the elegance of design in the figures which compose the group is completely marred by the framework of screens and windows in the background, constituting lines at right angles to each other.

I find these defects in several of his works, which are very painful to the eye. There is one cabinet portrait (No. 498) in which the gentleman is seated at a table running parallel to the base, and at right angles to the side of the picture, without being softened or counteracted by objects lying more or less acute. This portrait of himself is, apart from the objection of which I have been speaking, a fine specimen of the kind of work which I imagine Mr. Kareline will yet do wonders in; and I would strongly recommend him to pursue this walk as unquestionably that wherein his strength lies. This picture is certainly the finest illustration of his power in development. The completeness of forms in shadow are very admirable, showing Mr. Kareline equally master of shadow as well as of light.

Before closing, I must call attention to Mr. Kareline's cabinet portraits. They are very excellent in the realisation of many of the qualities to which we have alluded, such as still life; but his employment and treatment of such, and the extent to which he does so in this department of portraiture, is what I would take most exception to. I think there is too much attempted. Of course the figures in every case are well arranged, full of purpose, and completely developed; but there is a profusion of ornament and furniture which, although common to cabinet works, yet (such as is here employed) to a degree swamps and absorbs all human interest by their attractive forms, and in some instances by their light and spotted appearance is apt to give the whole work a very meretricious look.

Apart from this, some of Mr. Kareline's cabinet portraits are very fine, as I have said, both in arrangement and feeling, and it is a wonder that seldom or ever do we see anything in them like defective and imperfect sitting,

which all the more presses upon me the conviction that they are very short in exposure. His finest cabinet portrait, I think, was the Portrait of Mrs Kistkoff (No. 242). The ladylike character of this subject is beautifully worked out. The accessories in the picture are much quieter, and the never-failing mirror again successfully produces the lady in profile. If I might make a suggestion, I would recommend Mr. Kareline to make a complete change in his ornaments and furniture, because however varied they may be treated in arrangement, yet eventually these objects always cropping up will cease to charm, and become very stale. I think there is nothing like the adaptation of accessories belonging to the individual who sits for his portrait, if we could only get the use of them, but this is not always convenient.

I close by remarking that the lady's dress in this cabinet portrait is the most perfect development of a light dress which I have seen, and the tone of the picture throughout, I am certain, will not easily, if ever, be excelled in black and white.

THEORY OF THE HORIZONTAL PHOTO-HELIOGRAPH, INCLUDING ITS APPLICATION TO THE DETERMINATION OF THE SOLAR PARALLAX BY MEANS OF TRANSITS OF VENUS.

BY PROFESSOR WILLIAM HARKNESS, U.S. NAVY.*

THE term "Horizontal Photo-heliograph" is used to designate that form of photo-heliograph which, it is believed, was first employed by the late Professor Winlock, and which consists essentially of a fixed telescope, whose optical axis is accurately horizontal and in the meridian, and whose objective is directed towards the same side of the zenith as the elevated pole; the sun's rays being reflected into the telescope by a suitable heliostat. The sensitive plate for the reception of the photographic image is, of course, situated at the chemical focus of the telescope, the plane of the plate being perpendicular to, and its centre coinciding with, the optical axis of the telescope.

The heliostat mirror consists of a piece of highly-polished (but unsilvered) glass, whose two surfaces make an angle of about sixty minutes with each other. The front surface is worked as truly plane as possible, and serves to reflect the solar rays through the object-glass to the photographic plate. In working the back surface, no particular pains are taken; and, on account of its inclination to the front surface, any light reflected from it is thrown entirely away from the photographic plate. The object-glass is corrected for the chemical, and not for the visual rays. The distance between the object-glass and mirror is made as small as possible, consistently with keeping the latter clear of the shadow of the former. The sensitive surface of the photographic plate faces the object-glass, while the rays from the sun are reflected by the mirror through the object-glass, and after traversing the reticule they form an image upon the photographic plate.

The reticule consists of a system of squares formed by the intersection of two systems of very fine straight lines, which are drawn upon one side of, and respectively parallel to, the edges of a thin square plate of plano-parallel glass. In each of these linear systems the number of lines is odd, and the middle line is drawn through the centre of the plate. This reticule is fixed with its ruled surface toward, parallel to, and two or three millimeters distant from, the sensitive surface of the photographic plate. Moreover, one of the two systems of lines is set as nearly as possible vertical, and its inclination is accurately determined; and, to render assurance doubly sure, a plumb-line, consisting of a silver wire about 0.05 of a millimeter in diameter, is suspended between the reticule and the photographic plate, in

such a position that it may hang freely, and at the same time be very nearly in the vertical plane passing through the centres of the reticule and object-glass. As the light from the object-glass traverses the reticule before it reaches the photographic plate, the shadow, both of the reticule and of the plumb-line, is impressed upon every picture taken with the apparatus; and thus three different ends are gained: first, by comparing the squares of the reticule with the corresponding ones upon the picture, everything relating to the shrinkage of the collodion can be determined; secondly, the impression of the plumb-line, and also that of the vertical lines, furnishes upon each picture a fixed direction from which to measure angles of position; and, thirdly, the intersection of the middle vertical with the middle horizontal line furnishes a fixed point, which in the paper is designated as the centre of the plate. To determine the zenith distance and azimuth of this point, it is necessary to measure the zenith distance and azimuth of the corresponding point of the reticule, as seen from the second principal point of the object-glass. For that purpose, the mirror is temporarily removed, and a transit instrument is set up in front of the object-glass in prolongation of its axis. The object-glass thus becomes a collimator to the transit instrument, through the eyepiece of which the lines of the reticule may be observed as if they were at an infinite distance. It should be remarked, however, that as the reticule is slightly inside the visual focus of the object-glass, it is not generally possible to obtain perfectly distinct vision of its lines and of the wires of the transit at the same time. This difficulty is obviated by marking the intersection of the middle vertical and middle horizontal lines of the reticule in such a distinct manner that the slight maladjustment of focus does not prevent it from being seen. Then, by means of the transit, the reticule is adjusted so that the point in question is very approximately in the meridian, and at a zenith distance of ninety degrees. Finally, the exact azimuth and zenith distance of the point are measured.

The remainder of Professor Harkness's paper, which will probably be given *in extenso* in the *Memoirs* of the Society, is occupied with a full and detailed explanation, with diagrams, of the principle of the instrument, and of the models of measurement of the photographs.

NOTES ON PHOTOGRAPHIC CHEMICALS, AND THEIR ADULTERATION.

BY W. W. STODDART, F.C.S., ETC.*

THE following notes arose from some anomalous results that had been observed by the author of the paper while making some photographic experiments. It seems probable that chemical purity alone, however important, is not all that is actually necessary for the highest state of photographic manipulation. The purity of the different reagents is of the utmost importance to the chemist, but is even more so to the photographer. Sometimes the latter finds a difference in the working of baths and solutions, that chemistry alone cannot explain, and very often remains a mystery. The object was to show to the Society that physical properties have to be remembered, as well as the chemical. Most, if not all, crystals (especially when in a state of fine division) are affected by every ray of light having actinic power that falls upon them, a fact that is not often sufficiently alluded to in manuals and other works on photographic science. To prove that this curious fact is not mere theory, Mr. Stoddart exhibited several experiments, the most striking of which was the exposure of five or six simple substances to the light of magnesium ribbon. After an interval of a few seconds the room was darkened.

* Communicated by the Astronomer-Royal to the Royal Astronomical Society.

* Read before the Bristol and West of England Amateur Photographic Association.

On opening the box, the different substances were seen in an intense state of vibration, so rapid as to give forth a vivid light, having different colour according to the rate and power of the waves. On examination it was found that only the external particles, or those in direct opposition to the magnesium light, were affected. When they were removed the underlying particles were perfectly quiescent and dark. The light evolved in this remarkable manner continued for a considerable time, and was so bright that it could be seen all over the room.

Experiments were next described, pointing out what portion of the spectrum contained the greatest quantity of actinism, and also proving its presence in the invisible rays by reducing their rate of vibration, and so rendering them appreciable by the human eye.

The speaker then exhibited some samples of reagents that had been sent to him for analysis, and fully explained the most simple methods of ascertaining their purity or impurity. The first was some distilled water that had been purchased that morning. It was found to be free from all solids—as sulphates, nitrates, carbonates, and chlorides—but contained a large proportion of ammonia, which, being volatile, had passed over with the condensed steam. This was instantly detected by Nessler's delicate test, which showed by the colouration that a considerable quantity of ammonia was present. The necessity was thus shown of throwing away the first portion of the distillate that comes over, and which of course contains those things in the original water that are volatile. It may be that the presence of ammonia would account for many of those unaccountable occurrences before alluded to. It cannot be detected by the smell or taste, on account of the comparatively small amount; yet the reaction was so strong as to cause a great disturbance on the Nessler, although the quantity in the sample present did not exceed two or three parts in every million.

Some samples of glacial acetic acid were shown to contain traces of lead, copper, sulphuric, hydrochloric, and sulphurous acid. In one was manifested an empyreumatic tarry matter, that separated when neutralized with ammonia. The sulphurous acid was detected by the evolution of nascent hydrogen, a very pretty, although well-known method. To some of the acetic acid was added some pure hydrochloric acid and a little zinc. In the mouth of the glass flask was placed some moistened lead test-paper. The sulphurous acid present was decomposed into sulphuretted hydrogen, which announced itself by discolouring the lead paper.

A sample of gallic acid was shown by means of a solution of gelatine to contain a trace of tannic acid. An apparently pure specimen of nitrate of silver was placed upon the table that was adulterated with saltpetre to the extent of ten per cent. The only correct mode of testing the nitrate is by quantitative analysis, and thereby ascertaining the amount of oxide of silver.

Iodide of zinc in iodide of cadmium, and iodate in iodide of potassium, are not uncommon. A Continental sample of the latter was exhibited. The impurity is easily detected by a little tartaric acid and starch solution. If any iodide be present, it is quickly detected by the development of the well-known blue colour.

A quantity of hyposulphite of soda was examined, and proved to be mixed with sulphate.

THE IODIZING OF COLLODION WITH ANILINE SALTS.

BY MM. EDER AND TOTH.*

THE idea to employ organic iodides and bromides for sensitizing negative collodion is already an old one. Von

Monckhoven was the most fortunate experimenter in this direction, that gentleman recommending the employment of iodide and bromide of ethylamine for the purpose. The observation that iodide of ammonium forms, on mixture with alcohol, iodide of ethylamine after the action has continued some time, and that, therefore, a collodion treated with this salt has all the qualities of a ripe material, supported this recommendation of Monckhoven. The production of iodide of ethylamine is, however, connected with many difficulties, and altogether its introduction into practical use is hardly to be wondered at. This interesting result, however, which the alcoholamines of the series of fatty acids furnished as iodizing salts, caused us to undertake an investigation with the amines of the benzole series.

We chose aniline, the prototype of the above mentioned series, as the starting point of our research; it possesses, as its salts do in a much less degree, the quality of being able to absorb bromine and iodine. Hydro-iodide and hydro-bromate of aniline was produced by taking sulphate of aniline (three parts), and iodide of potassium (three parts), and bromide of potassium (two parts), and dissolving them in as little water as possible, and adding alcohol to the solution. The filtrate of crystalline precipitate (salt-petre) yielded, after evaporation on a water bath, long and only slightly tinted needles of the aniline salt.

With these we prepared two collodions:—1. One iodized by mixing a solution of 4.0 grammes of hydro-iodate of aniline in 50 grammes of alcohol with twice its volume of normal collodion, which had been prepared with two per cent. of pyroxiline. 2. A second, bromo-iodized, by means of a solution of 3.4 grammes of hydro-iodate, and 0.5 grammes of hydro-bromate of aniline in 50 grammes of alcohol.

The collodions became strongly coloured, after mixing, of a golden-yellow tint, and they contained the same proportion of iodine and bromine as an ordinary negative collodion. Both of them, however, gave unfavourable results. The films, when sensitized in a ten per cent. silver bath, were uniform enough in character, but yielded thin and very flat pictures. The exposure necessary was, all things considered, longer than in the case of ordinary collodion. As was fully to be expected from the decomposable character of aniline compounds, the aniline collodions were prone to rapid decomposition, and in the course of two or three weeks they became of a deep red colour.

We communicate these results, unfruitful as they apparently are, because they add to our knowledge of collodion and iodizers.

SELLING ALLEGED INDECENT PHOTOGRAPHS.—A few days ago, at Southwark, Louis Flowers, 18, a German Jew, was charged by the police with selling photographs of an indecent nature in the New Cut, Lambeth. William Melville, 226 L, said he was on duty in the New Cut on the previous afternoon, when he saw the prisoner go up to a gentleman, take some photographs from his pocket, and offer them for sale. From what the gentleman told him he went up to the prisoner and took from him several photographs which he considered to be indecent. The prisoner then went to a barrow on which he had many others of a less indecent nature. Mr. Safford, the Chief Clerk, said that these photographs were similar to some seized by the police on the same spot about two years ago. It was shown that they were copies of French pictures exposed in the Galleries. Mr. Partridge was of opinion that some of those first seized by the constable, and which the prisoner had offered for sale, were very indecent, but still he did not think that they came within the meaning of the Act of Parliament. He required the prisoner, however, to enter into his recognisances to come up for judgment when called upon, and directed the police to keep possession of the photographs. Inspector Whiting, L Division, who had them in his charge, shortly announced that the prisoner had consented to have them destroyed. Mr. Partridge requested the inspector to see that they were.

* Read before the Vienna Photographic Society.

The Photographic News.

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VIOLET LIGHT FOR STUDIOS.

A FEW weeks ago, referring to M. Scottelari's proposal to secure increased chemical action by glazing photographic studios with violet glass, we pointed out the fallacy upon which we conceived his proposal was based, showing that white glass transmitted all the solar rays, violet as well as others, and that violet glass effected no more. M. Scottelari, referring to our remarks, writes to the *Moniteur de la Photographie* as follows:—

"SIR,—In its impression of the 5th January, the PHOTOGRAPHIC NEWS gives an account of an experiment tending to prove that under violet glass photographic printing goes on more slowly. Although the conditions of the experiment alluded to are altogether different to those upon which I have based my system of lighting studios, I have still every reason to believe that the result would have been, even in this case, favourable to violet light, if only the experiment had been made in a more complete fashion. At the same time, I am glad to see that the very impartial author of the article asks his readers to undertake on their part further experiments on the subject. Here, then, is an experiment which would recommend; it is of an elementary character, and quite within the reach of all. Let a ray of sunlight penetrate a darkened room, the ray coming in through a tiny slit in the shutter. In the passage of this ray interpose a prism. Upon a screen placed at a certain distance will be perceived the beautiful tints of the rainbow, and if the experimenter will now place against the screen a sheet of sensitized paper or any other sensitive surface, he will soon find out the superiority of the violet rays in respect to its chemical action. I am convinced that the honourable experimenter in England, whose results have been given in the PHOTOGRAPHIC NEWS, will make it a pleasure to repeat this experiment, and to communicate his results. Will you agree, &c., SCOTTELARI."

M. Scottelari states here, correctly enough, what is well known to all students and experimentalists in the science of light. That the violet ray is the most chemically active no one will dispute, and a photograph of the solar spectrum will, of course, readily demonstrate this. But if, instead of decomposing the beam of light by means of a prism, M. Scottelari will receive the entirety of it upon a sensitive surface, he will find the whole will produce as much chemical result as did the violet ray when separated by a prism from the other rays.

The case carefully examined is really a very simple one. A window glazed with white glass transmits the whole of the solar rays which reach it, the violet amongst the rest. A window of the same size glazed with violet glass would transmit one-seventh part of the rays reaching it, and these the violet or active rays; but it would not transmit

a single violet ray more than the other window. Hence, unless it be argued that the other rays which are contained in white light are absolutely obstructive, no more actinic power could be transmitted by the second window than by the first. That is the point to be demonstrated in aid of M. Scottelari's position, namely, that the presence of the other elements of white light, besides the violet ray, are not simply inactive chemically, but that they are absolutely obstructive or destructive to the chemical action of the violet ray. Such a theory was, we know, held by some of the old experimentalists, some of whom manifested a tendency to transcendentalism in relation to the new science of light; but general experience has simply proved that the non-actinic rays are inactive, or at least inactive upon the sensitive surfaces which have been hitherto discovered.

And in referring to the chemical activity of light it must always be estimated in relation to the sensitive surfaces which science has so far discovered. Hitherto, with the haloid salts of silver, and the chromic compounds known in photography, the violet ray is active, and the yellow ray without action; but, according to Draper and others, all the rays probably possess photogenic power on some substances. It is possible that M. Scottelari may have evidence to show that the yellow and other rays, except violet, have an antagonistic influence, and obstruct the action of the violet ray on bromo-iodide of silver. And if this be so, it can be demonstrated by direct experiment. Such a demonstration would lead to other important results, and suggest a revolution in the dark room, which, being generally illuminated with yellow light, should tend to obliterate the image which had been impressed by violet light when a plate was exposed for the purpose of development.

When M. Scottelari referred to his experience with a studio lighted through violet glass as giving decidedly better and quicker results, we were constrained to believe that he was under some illusion, induced by a mistaken preconception of theoretical considerations; but courtesy demanded acceptance of his facts. When, however, he refers us, for confirmation of his position, to experiments which we and others have tried many years ago, we feel bound to point out the fact that these experiments do not justify his conclusion that the violet rays of a given amount of white light effect more work than the whole of the white light containing those violet rays.

MORE ABOUT VIOLET GLASS.

MR. GAFFIELD has recently made the experiment of exposing a sensitive bromo-iodized plate under violet glass, and finds the result similar to that on chloride of silver. He says:—

"I made the experiment with Mr. Marshall in his photographic rooms a few days ago, by placing a light shade of violet glass and a colourless glass side by side over a wet, sensitized plate, and then exposing it to light for about a second by pulling out the slide of the shield, and pushing it back again immediately. The result showed, just as I had expected, the fallacy of the claims of M. Scottelari. The plate under the colourless glass was darkened much more sensibly than the portion under the violet, thus proving the inferiority of the latter, which cut off a considerable proportion of the chemical rays.

"From all that I can learn from intelligent photographers and photographic journals, it is a most surprising thing that in France, a country so advanced in scientific knowledge, any company of photographers could be found to give audience to the singular and oft-refuted claims made by M. Scottelari.

"It is undoubtedly true that violet or other coloured screens may be used with advantage in cutting off too much, or in making an even diffusion of light upon the face of the sitter; but it never can be true, while two from six leave a less number than six, that the cutting off of a

third, or any fraction, of the chemical rays of sunlight by violet glass in a screen or skylight can enable the photographer to obtain more rapid or effective results. The use of screens of various colours, and in varying positions, according to the more or less favourable conditions of the weather, or the location of the studio, is almost universal with good photographic artists, and we do not see any novelty in M. Scotellari's idea, or any peg to hang a patent upon."

PHOTOGRAPHY IN THE RUSSIAN ARMY.

THE mobilisation of a large portion of the Russian army on the Pruth has led to some activity upon the part of the staff to perfect as much as possible the science of warfare in the field. For many months past the Russians have been busily engaged in seeking the best information connected with war matériel, and in applying to their own uses such results as have been secured by other nations in one branch of war science and another.

Both in France and in England, it may be remembered, some experiments have been made of late to utilize photography—or, rather, micro-photography—in the topographical departments of the war offices. In France, M. Dagron—whose wonderful pigeon films during the Paris siege must still be fresh in the minds of our readers—has, in conjunction with M. Nachet, an eminent Paris optician, been engaged in reproducing the ordnance maps to a tiny scale, so that hundreds of them could be put into a small space and conveniently carried. Mr. Baden Pritchard, of Woolwich, has been similarly employed on the part of the British War Department, the maps produced by his process being of thin transparent gelatine, toughened by chemical means, and upon a less reduced scale than those of the French government. In the case of Mr. Pritchard's micro maps, roads and routes, as well as names of places, can be made out with a sharp pair of eyes, owing to the remarkable clearness of the details, and are distinctly legible with the aid of an ordinary magnifier, while their weight is such that the whole series of ordnance maps of the United Kingdom could be carried in a pocket-book.

In Russia, steps are being taken to make use of photography in a somewhat similar manner. Colonel Kowako has, it appears, designed a photographic apparatus for the field, which, among other things, serves for the production and enlargement of micro-photographic maps and despatches. The whole affair is in bulk no larger than an ordinary knapsack, and may therefore be carried by a soldier in the field without difficulty. It consists of a perfect photographic laboratory, and contains chemicals sufficient for six months' work.

But the great feature about it seems to be an enlarging apparatus for the amplification of micro-photographs, and which permits of working day and night. Despatches may be enlarged, it is said, 2,300 times, so that there would be no difficulty, supposing the various army corps were each of them supplied with one of these knapsack apparatus, for one general to communicate to another by means of micro-despatches almost invisible to the naked eye.

No precise information as to the details of this compact little apparatus has yet been published, for, as everybody knows, the Russians are peculiarly tenacious in keeping army secrets. We do not suppose, however, that there is much novelty connected with it, and we make mention of the affair simply to show how alive foreign governments are to any improvements which science affords. In this country it has for some time past been the custom to include a photographic equipment in the necessaries of our staff, and in our recent wars considerable use has been made of the art; but the adoption of a miniature apparatus for field purposes is novel, and is, we believe, the first instance of photography being placed in the van of an army. It would be interesting to have some additional information in regard to Colonel Kowako's apparatus, of its capabilities and mode of working; and, no doubt, if war

should unfortunately break out, this will not be wanting. It may be mentioned, by the way, that the first application of photography to warfare took place in Russia during the Crimean war, when two young British officers, having been previously instructed in the art by Mr. Mayall, were attached to our troops in that memorable campaign.

CARBON PRINTING.

BY A. WELLESLEY TURNER.

IN compliance with my promise to render whatever practical aid I could in this process, I will now, discarding for the time all theoretical questions, give your readers as clear and precise an account of the method I adopt as lies in my power. I will imagine for the time that I am at work, so as I can better describe the materials and utensils in use, as well as the method of using them. I have been induced to do this purely from a motive to give carbon printing every opportunity of making itself familiar to the profession, and at the same time I wish to state that I withhold no little dodge or secret in the production of enamelled carbon prints, if any exist, a fact I greatly doubt. The process, I can assure my readers, is a plain and workable thing, if my directions are followed with care and cleanliness. It is a great mistake on the part of those interested in the progress of carbon printing—which we all are, or should be—to keep back any fact connected with its working that would in any way help those who wish to "pick up" the process, as one of your correspondents said was done. I have noticed in the multiplicity of articles on this subject that all the hints and information given on the process have been from time to time published in this journal, but in such a disjointed way that those not acquainted with the process could not necessarily comprehend their value, and consequently taught the uninitiated little more than the fact that the process abounded in endless difficulties, however useful such information may have been to those better acquainted with its details.

Without further comment I will now describe exactly the operations necessary for the production of carte and cabinet enamelled carbon prints, as worked successfully by me, together with my experiences, as far as I think necessary, in each branch. We will commence with the sensitizing, and with this intent I will introduce my readers to the room kept specially for this purpose. It is a comparatively large room, in as cool a part of the premises as possible. In it is an ordinary window with pulleys, opening top and bottom; the panes of glass are muffed with orange paint all over; to obtain a draught of fresh air the window is raised at the bottom, and lowered at the top about six or eight inches, across which is tacked a piece of yellow calico twelve inches wide; this, coming from the inside framework of the window sash, entirely excludes white light, and allows free access of air, which can be closed or not, at will. Immediately under this is a large bench for cutting tissue and transfer paper into the necessary sizes, and also for sensitizing on, on the left of which is a case for keeping the tissue, &c. Across the room is stretched on rings at each side three lengths of strong string with ordinary American clips attached, and this, with the shelves, &c., completes the furniture of the apartment. We will now, with your kind permission, commence operations, the first of which will be the making up of our—

Sensitizer.—This is a very simple compound, and is composed of a solution of bichromate of potash with a small quantity of ammonia. The strength usually recommended is five per cent. bichromate; but I always vary the strength of the sensitizer according to the temperature of the weather, using from four to eight ounces of bichromate to the gallon of water, or from two and a-half to five per cent. In the heat of summer, when the tissue is most sensitive, I use it as low as two and a-half per cent., and gradually increase the strength as the weather gets

colder; and if we have a particularly severe winter I have found it necessary to use a six per cent. bath; but I have not used it over five per cent. this winter; so that it will be seen that this is a matter that requires considerable judgment. But the necessary strength of the bath is easily ascertained by the fact that if the prints produced are much flatter than they should be, and the tissue is more than ordinarily sensitive, then you may know that the bichromate is too strong; and if, on the other hand, the delicate details of the prints wash away during development, leaving ugly white patches, in that case the bath must be made stronger. I prefer my bath to be just past this last condition, as it then gives the most brilliant prints. It is also preferable to have baths of different strengths to suit the class of negatives, a rather stronger one being required for hard negatives with little details in the lights, and *vice versa*. But this, from a practical point of view, is hardly possible when a large number of negatives have to be printed from, and I only have resource to this plan in case I have a great many to print from one negative, and then, of course, I can make up a bath specially suitable. For a bath, however, of five per cent., we will take eight ounces of bichromate of potash and dissolve it in a gallon of water (160 ounces). To do this, I put the bichromate in an ordinary jug kept for the purpose, and pour upon it boiling water; stir this up two or three times, and empty it into a gallon bottle half filled with cold water; this will leave behind in the jug a great part of the bichromate undissolved, to which add more boiling water, and repeat the operation till all is in solution; then fill up the gallon bottle and add about a drachm of ammonia, and when perfectly cooled we are ready for—

Sensitizing.—For this purpose I cut up my portrait tissue into sheets 15 inches by 21, which will, when sensitized, divide into eight cabinet, or four cabinet and eight carte pieces. This is the most economical and convenient size to cut the tissue, and by dividing the whole band in the centre with a fine tool saw previously, we have two small bands in fifteen inches in length, which can be very expeditiously cut into the necessary sizes. The transfer paper I treat in the same manner. I sensitize the tissue by immersing it in the bichromate solution placed in a dish 22 by 26, so that it can be used for large prints, if necessary, up to 20 by 24, although my remarks now more particularly apply to small work. The tissue should be previously dusted, to free it from any adhering particles, and, when in the solution, must be drawn two or three times through the bichromate, so that it flows evenly all over. It must be handled as little as possible, more especially in warm weather. About a minute, as a rule, is quite long enough for it to remain in the bath, although the best test for this is to leave it in until the tissue has a slight inclination to curl, when you may be sure that it has absorbed sufficient sensitizer. I then take it by the two corners, and draw it out of the solution, surface downwards, over a glass rod attached at the near end of the dish, to free it from as much surplus solution as possible. The tissue is then thrown over the string, surface outwards, and previously having arranged a clip at each side, I immediately raise the two corners of the tissue nearest me, and lower it over the string, till, by holding one corner with my left hand, I can allow the other to slip over the string, and catch it with the clip ready opened by the right hand; I then have both hands at liberty to catch the other corner. The tissue by this means is very easily hung up, and it is only touched with the warm fingers for a few seconds at the extreme corners. The solution runs evenly off the tissue, and being freely exposed to fresh cool currents of air on both sides will, in the dampest weather, dry before morning if sensitized over night, and in the middle of summer will not get too hard. This I find the most uniform method of drying the tissue, and giving little or no reticulation of the film. I can say that, without using ice or any other method of artificial cooling, I was only troubled

with a sign of this plague for a few days during the hottest part of last summer, although I must confess that we should have entirely eradicated this bugbear from existence before. I have studied the subject much, but I am afraid I can offer no perfect cure for the evil, beyond advising the use of as weak a sensitizer as possible to give good results, with a short immersion in the bath, and keeping and drying the tissue before and after sensitizing in as cool a place as possible. The use of ice is too expensive, but, as a substitute for this, it is a good plan to keep the bottle containing the bath, during the summer months, in a metal box filled up as far as the neck of the bottle with the coldest water obtainable in that time of the year, or allow a current of fresh water to continually run through the box to keep it cool.

We will now lock the door, and leave the tissue to dry, which we shall find done by the next morning. In the mean time, let me give a few words of advice before I close the subject for the present. It will be seen that I keep a room specially for sensitizing, and I would advise all who can to do so; but in many establishments it could not be spared, especially when only beginning on a small scale; in this case care must be taken that the principle of coolness and ventilation be carried out in the most convenient way to suit circumstances. Dry the sensitized tissue without artificial heat, except in cases when the weather is so damp that the paper by the next morning is still a little tacky, as it will be sometimes. It may then be dried safely by holding it a little distance from a stove, or hung up a short time in a very dry room; there will not then be the slightest danger of the gelatine running off the paper, as it will be well set and contain too little water to do so. Care should also be taken that the sensitizing room is free from foul smells, and do not in any case leave the gas burning in the room to hasten the drying, as these conditions are injurious to the good health of carbon tissue as well as man. Those commencing carbon printing should not do so unless they have everything under favourable circumstances, and with due care, you may make shift with dishes or other apparatus; but you must not overlook the principles upon which the operations are based: a failure in the first trial is more discouraging than a half dozen after you know sufficient of the process to appreciate its qualities. I would certainly advise all who wish to keep pace with the times to try their hands at this process, not as a mere plaything, but carefully and energetically, with the full intent to succeed; and for such I am certain that success, as far as the process has reached that point with others, will be their reward. I would lay particular stress on the fact that it is not a thing to be picked up without study and perseverance; and it is a mistake to employ cheap labour in this branch, especially to commence with. If a photographer cannot find time to do it himself at first, do not leave it to some uninterested assistant printer, or such like, perhaps simply because he has more time to spare than any one else on the premises; like all things, if it is worth doing at all, it is worth doing well, and though it may be found tedious at first, ease and quickness of production will come with practice.

(To be continued.)

A COLLODION WELL.

BY NELSON K. CHERILL.

THE following description of a very simple affair may perhaps be of some use to readers of the NEWS. For my own part I was driven to adopt the expedient of burying collodion in a well, by circumstances to which I may for a moment advert. I had a stock of collodion which I wished to iodize, and keep it for two or three months before use. Collodion should be kept, so we are told on the labels, "in a cool place;" and I had not, at the time of iodizing, any cool place at my command; I therefore determined to try the plan of burying the bottles, which I will now describe. I dug a hole in the garden about two feet deep by one

foot square; into the bottom of this hole I lowered an empty kerosene tin, with the top previously removed. Into this tin I placed the collodion bottles, putting a square piece of wood on the top of the tin, to serve as a lid. Then, on the surface of the ground, over the hole, I placed a piece of matting about two feet square, and on this two or three pieces of rough boarding; and over the whole I piled up earth to the height of about one foot. To prevent the rain washing the dirt down into the hole, I threw a packing case lid on the top of the mound, securing it by a couple of sticks, in a standing position.

About six weeks after my well was complete! and stocked, I went to look at the contents, and found the experiment to have been quite a success; the collodion was ripened, and of the rich colour and perfect clearness that indicate the best working order. The day the well was opened it was very hot outside (thermometer stood about 80° in the shade), but the well was quite cool, as might have been expected. As this plan is so simple, and yet so satisfactory in its results, I intend to adopt it regularly for the future.

I am aware that photographers who enjoy the luxury of having extensive cellars attached to their premises do not require any such expedient as I have mentioned to enable them to keep their collodion in good order; but, on the other hand, there are very many who have not this convenience, or, indeed, any for keeping their collodion as it should be kept; and I fancy that, especially in hot weather, the plan I have adopted will be found very useful. The use of the matting over the hole is to enable the well to be opened without sending a lot of earth into it.

Christchurch, N.Z.

Correspondence.

MEDALS AND EXHIBITIONS.

SIR,—Before the Edinburgh Exhibition took place, I had occasion to speak against the system of awarding medals. I did so chiefly on the ground that five or six men cannot by their award establish the superior excellence of a picture; or, in other words, that there is no exact measure for works of art, and, consequently, that the award of a jury merely shows the opinions of the men who compose it, without establishing the exact excellence of the subjects of their award. It may now be asked, Have the awards made at the Edinburgh Exhibition invalidated my position?

Allow me to state that, along with the other members of the Society, I believe that the jurors, all men of mark, were as good as could be had, and that their opinions are worthy of the greatest consideration. But still the fact remains that these have not been universally received. In the Exhibition rooms I met many photographers, several artists, and a number of other people, some of whom are men of recognised taste in the higher circles of art; but I did not find a single one who thought the prize picture the best in the room. Some preferred other pictures by Mr. Kareline, and some proffered pictures by other photographers.

Mr. Norman Macbeth's very able paper on Mr. Kareline's pictures, in your last number, is well worthy of considerate perusal. Without doubt, Mr. Kareline is an artist, and not merely a mechanical photographer. His pictures are very effective, and carefully finished. But he indulges in peculiarities. He rejoices in strong contrast, one might almost say conflict, of lights and shades; and by introducing white curtains, and large reflecting mirrors, and abounding accessories, he is apt to make these the chief part of his pictures. Even in his prize picture, the chief feature is a long white muslin curtain, against which a man sits in shadow—savouring, it must be said, somewhat of "trick." In his own style, his composition is excellent, and his technic admirable; but, whatever the

reason may be, his pictures generally are deficient in two of the great requirements of art—gradation and simplicity.

It is evident that pictures containing such mingled qualities of excellence and peculiarity give room for very different opinions being formed, according to the point from which they are viewed. On the one hand, we have opinions, worthy of consideration, expressed by the jury; and on the other, we have opinions, equally worthy of consideration, expressed by men of acknowledged taste and culture in art. And to what conclusion does this lead us? Simply to this, that a limited number of opinions on works of art is no criterion of the excellence of said works. This conclusion does not tell against the individuals who compose juries of award. The fault is in the system, which necessitates a jury to give a verdict which they cannot warrant to be correct; and the argument against the system is strengthened by the fact that opinions of our exceptionally good jury do not coincide with the opinions of men who are equally qualified to judge. In short, the motto of the medal system in art is "uncertainty," a by no means satisfactory word.

But we are told that many excellent pictures would not have been sent to the Exhibition if there had been no enticing medals. Let us hope that all the men who sent these many excellent pictures have each gained one of the sixteen silver medals, or at least one of the sixteen bronze medals, or, at any rate, are enabled to enjoy the consciousness that they had good intentions, which no doubt will sufficiently console them in their failure, and encourage them to "put in" for the next exhibition. It is to be feared there are photographers, though they be men of not very high type, whose great desire is to gain a medal, that thereby they may push their trade; whilst others, no doubt, enter themselves for the letters of awards with the feelings which one entertains towards a time-honoured institution. It has been the custom to have medals at exhibitions, and so an exhibition without medals may seem a poor affair. Well! we have had our age of "bronze," and may hope that ere long the love of medals will give place to the love of art, and that photographers will be contented to exhibit their works for the judgment of the public on their own merits, without thinking that the chief end of a photographer is to be distinguished by the sanction of five or six men.

I trust I have said nothing, either in letter or spirit, that seems to bear against the Edinburgh jury, who are all men of high standing. My remarks are directed solely against the system.—I am, &c.,

W. NEILSON.

Edinburgh, Feb. 19th.

PROPOSED MEDAL OF PROGRESS.

DEAR SIR,—Mr. Pritchard, in giving instances of how medals are given abroad for researches in photography cites three instances, in each case foreigners. He might have gone nearer home, as I had the honour of receiving the special medal of the French Photographic Society for the year 1871, an honour I value all the more as coming from another country than my own.

If the suggestion of Captain Abney should ever be carried out by our English Society, I would beg to offer one suggestion: that medals should only be given for published or patented processes. Witness one of the cases cited by Mr. Pritchard, that of M. Rousselon. When, some years ago, I publicly challenged that gentleman to show that the method known as Photo-gravure (Goupil et Cie.), was not substantially the same that I had communicated to him, the only reply was that the process would be published shortly. I have waited in vain through several years for this proof, and have, therefore, every reason to believe that the method adopted by that gentleman is what I have all along believed it to be.

I give this as an instance of how any one working a

secret process—which may be his own, or may not—may become the recipient of an award which he has no right to as original inventor.

WALTER B. WOODBURY.
The Manor House, South Norwood, S.E.

HEAD REST.

DEAR SIR.—Mr. N. K. Cherrill's remarks on head-rests in your issue of the 9th inst. have just come under my notice; and, fully endorsing those remarks, I wish to point out what appears to me to be a readier mode of attaining the desired end, and one quite easily applied by any photographer to any rest he may possess.

Let him procure a half-round or Rattail file of suitable size, and file a channel down the socket in which the rod



slides, thus as at A, and the necessary effect is at once produced. To leave the raised projections as in Mr. Cherrill's sketch would be a work only possible to a skilled mechanic, and then by no means easy of performance.—Yours obediently,

F. LANE.
Rotherham, February 17th.

DALLASTYPE.

DEAR SIR,—I have just seen the paragraph in your last issue, taken from the *Paper and Printing Trades' Journal*, announcing that the *Journal für Buchdruckerkunst* attributes to Pretsch the photo-galvano-plastic process known as Dallastype. The fact is, Dallastype is not a photo-galvano-plastic or photo-galvano-graphic process at all. The *Journal für Buchdruckerkunst* ought to hold its peace, as it meanly burked my letter, published here, exploding the Pretsch claims and Herr Leipold's backing thereof. The facts brought forward were not palatable. They had been published here in the country in which Pretsch had every facility given him that thousands of pounds could procure to prove his title to be considered a man of original invention, or a practical photographer and electrotypist, but miserably failed. If Pretsch had been an Englishman or a Frenchman, *Journal für Buchdruckerkunst*—long, lumbering name—would not have been so ready to credit him with other people's work. Aye, and if he who succeeds where others fail is entitled to what credit may be due, even photo-galvanography—credited, as it has been, to Pretsch—was my work, though not my idea. The honour of the idea belongs to the Imperial Printing Office, Vienna, where experiments were made with Fox Talbot's gelatine and bichromate of potash process. Councillor Auer, the former director of that establishment, stated that the experiments were made under his directions. Pretsch stated that he had never heard of Fox Talbot's discovery, but that he had carried out all his experiments at his own private lodgings. Who is to be believed? Certainly not Pretsch, as it came out afterwards that Fox Talbot's process was described in the "*Journal of the Photographic Society*," and that both Pretsch and the Imperial Printing Office, Vienna, took in that journal regularly.

I enclose you a specimen from a Dallastint block, which has appeared in this month's *Geological Magazine*, and has been machined with the type. The original was an albumen photograph. Perhaps I shall find, some day, *Journal für*, &c., claiming this invention also for the renowned Pretsch!—Yours truly, DUNCAN C. DALLAS.

[The example enclosed is very good for a process of the kind.—ED.]

EMPLOYERS AND OPERATORS.

DEAR SIR,—In your impression of Feb. 16th you have reprinted a paragraph from the *Oxford Times*. I make no comments here upon the spirit in which that report was published, nor need I make any statements to you in reference to my intentions respecting it; but as I conceive that it has been sent to you in a spirit of malice, and with the intention of doing me injury with the public, I must ask you, as a matter of common fairness, to make a statement or two which has been withheld, and which may have the effect of more equally dividing the blame.

Sir, in the first place I admit (and did admit at the court) my legal indebtedness, but I lost so many things through my last two operators, the last six months for which I could not get any redress, as they ran away; and missed goods while Peasland was here, and could not get a satisfactory answer from him. From loss of another kind, arising out of his total inability to do the work for which I engaged him, I did not expect to save myself. This charge was abundantly admitted by him engaging himself to come to work for half the price, an agreement which he never kept. That he was on the whole not badly treated by me will be pretty clear, that he wished me to enter an agreement for twelve months; but as I had frequently to remonstrate with him respecting his general low behaviour, details of which I need not now give, I refused to accede to it. So much, sir, I conceive to be due to myself, in explanation to the one-sided report which you have printed; and I also think to be due to other photographers, who should be put upon their guard against the Peaslands of the profession.—I am, sir, yours faithfully,

J. GUGGENHEIM.

56, High Street, Oxford, Feb. 19th.

[Our correspondent will doubtless see that we could have no feeling in the matter, as we reproduced the paragraph in its entirety from a respectable local paper; another local paper giving substantially similar details. If any injustice is done to our correspondent, or any annoyance caused him, we regret having given the statement currency.—ED.]

Proceedings of Societies.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

THE usual monthly meeting was held on December 5th, 1876.

The SECRETARY read a note from the President, Mr. H. J. Newton, stating that he could not be present at the meeting.

On motion of the Secretary, Mr. J. B. Gardner was called to the chair.

The minutes of the last meeting were read and approved.

The SECRETARY said that at the October meeting of the Section our President, Mr. Newton, exhibited some silvered paper which had been prepared some eighteen months before, and at the time of exhibition was, to all appearances, in good condition. It may also be remembered that some six years ago he (the Secretary) made some experiments with silver paper, and that on two occasions since that time he had practically tested it, and exhibited the results. To-day it occurred to him to again look at his silvered paper, and, by the date marked on it, he found it was prepared on the third day of the third month, six years and over, and the paper appears yet white and in good condition.

Dr. MILLER said the paper which Mr. Newton gave him he had attempted to use without fuming, and found it gave a very weak print indeed; but he remembered that the President's advice was to place at the back of it a pad that had been immersed in a solution of carbonate of ammonia. This he had done, and the paper printed well. He thought it was rather difficult to tone, but still he regarded it as an acquisition.

The CHAIRMAN said that Mr. Newton's process was to silver the paper, and, when nearly dry, to float it, back down, on a solution of one ounce of hydrochloric acid to forty ounces of water. Now the Secretary's method was to float the paper the albumen side down. In regard to Mr. Newton's mode of preparing paper, he would say that he made some experiments in that line, and found that when the paper was floated on the

back, it required careful handling to prevent it from being wet on the other side. If the paper is in the least way damp, the solution will creep over the edges; and hence he inferred that that method would not come into general use for gallery work, but for amateurs and experimentalists, where time could be given, it may possess advantages.

The SECRETARY remarked that his theory was, that by converting all the silver into a chloride, and then rendering it acid, we could thus prevent the paper from changing. But to do this we must change all the free nitrate of silver into a chloride.

Mr. ANTHONY stated that the main point was to get rid of the free nitrate, and to do this a salt of silver must be formed that does not act on the sizing of the paper, and changes the colour even in the dark. He made paper in which the free nitrate was reduced to a minimum degree, and it has kept well at a moderate temperature; but in hot, damp weather becomes partially discoloured. It is absolutely necessary to have no nitrate in it. By the word nitrate he meant the free nitrate of silver.

Mr. DUCHONNEAU remarked that he washed his paper in water, and then dipped it in a solution of bicarbonate of soda, and it keeps from two to three months; but it does not print as well as freshly silvered paper.

Mr. ANTHONY said that some months ago, eighteen or more, a committee was appointed to experiment in regard to the means of removing the hypo from silver prints after they were fixed, by the use of lead and other solutions, as recommended by Mr. Newton and Mr. Anthony. At the time these experiments were made, there appeared, from the chemical tests used, to be no hypo left in the prints. He would suggest that at an early day, say the next meeting, this committee report to us their present condition.

The CHAIRMAN remarked that if it was the wish of the Section, some of the committee would report and exhibit the prints then made at the next meeting.

On motion of Dr. MILLER, the committee was requested to report at the next meeting.

The SECRETARY said that it would doubtless be gratifying to the members to hear that our President, Mr. Newton, had received the silver medal of the Institute for his prints from emulsion plates, exhibited at the late fair of the Institute.

A lantern exhibition of some exceedingly fine views, taken by Mr. T. C. Roche at Washington during last summer, was next given. The collodion used was made with Anthony and Co.'s new cotton. The views elicited much commendation from the members. After which—

The SECRETARY remarked that he knew that the members felt deeply grateful to Mr. Anthony, not only for this fine exhibition, but for his many other favours to the Section; but he thought the occasion should not pass without some expression on their part that would be recorded on the minutes. Mr. Anthony not only shows us what he can do, but is always willing and anxious that others should present their work also. He would, therefore, suggest to the members to bring to the next meeting, not only their best work, but also their failures, as from them even we can learn something.

Adjourned to the first Tuesday in January, 1877.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 8th inst., Mr. ALFRED BROTHERS, F.R.A.S., President, in the chair. The minutes of the previous meeting were read and confirmed.

The PRESIDENT called attention to the following resolution of the Council, and requested members to supply lantern pictures and other objects of interest on the occasion:—"That the next meeting of the Society be a social one, and that an extra provision be made at the cost of the Society."

Mr. COVENTRY volunteered to work the lantern on the occasion.

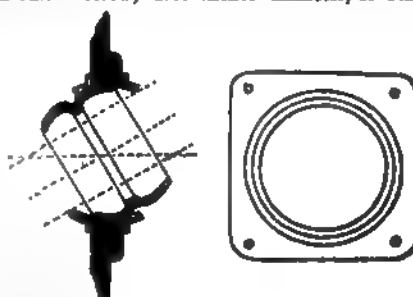
Mr. E. E. Wigglesworth and Mr. S. H. Ashley Oakes were elected members of the Society.

Mr. WADE exhibited a print by the Prussian-blue process. At the time the print was produced, four years since, it was cut in two, and one half exposed to the weather for a month. This half was found to be quite equal to the other, no signs of deterioration being visible in either.

Mr. JAMES YOUNG exhibited a gelatine emulsion plate, which had been dried with a piece of non-actinic paper over it, in which there chanced to be a pinhole. This small aperture had acted as

a lens, and projected an image of a Venetian blind on to the plate, sharp enough to show unmistakably how it was produced.

Mr. NOTON showed a ball-and-socket lens mount for camera front, a la Shadbolt. The "ball" (an oblate spheroid) is three seven-eighths diameter, two inches through, screwed (20) inside to take an outside screw, three inches diameter, or other smaller



size by using an adapter. An angle of twenty degrees from the perpendicular, in any direction, can be had when the lens jacket is two and a-half inches diameter. A much greater angle is obtainable with a lens diameter, a two-inch giving an angle of thirty degrees. The whole of the brasswork weighs seventeen ounces four drachms.

Mr. CHILTON brought before the meeting some transparencies by the gelatine emulsion process—"Franklin's" formula—which were much admired.

Mr. FRANKLAND having exhibited a number of carbon prints by Mr. Higginson, of Southport, which excited great interest, and were much admired, said he had much pleasure in bringing these specimens before the meeting. Perhaps no department of photography had received so much attention of late as carbon printing, which many had attempted, and in which many had failed. Mr. Lambert, however, seemed to have imparted new life and spirit into it, and that which before seemed to be commercially a failure promised to become a success. He (Mr. Frankland) said his friend, Mr. Higginson, was one of the first workers under a licence from Mr. Lambert, and the pictures on the table, sent at his request, were specimens of Mr. Higginson's everyday work. They were not only perfect as carbon work, but as art productions also; and the fact that gentlemen from all parts of the country had visited Mr. Higginson in connection with the subject testified that he had done in carbon what had not previously been accomplished. He (Mr. Frankland) had had an opportunity of going through the whole of the various operations, from the sensitising of the tissue to the stripping of the finished picture, and had concluded that the production of small work in carbon was a commercial success. He hoped the Autotype Company would see the wisdom of returning to their old liberal policy of supplying material to the profession without insisting on a license being taken to enable purchasers to use the materials when bought.

A vote of thanks to each of the gentlemen who had contributed to the interest of the meeting concluded the proceedings, and the meeting was then adjourned.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday next, 8 arch 1st, at the Rooms of the Society of Arts, Adelphi, a paper will be read by Mr. Peter Mawdaley, on "The Collodio-bromide Emulsion—some of its applications."

FRESH ALBUMEN.—Mr. N. K. Cherrill, writing from New Zealand, says:—"I think I made a note on albumenized paper in a former letter. The material I have the pleasure to see here would be the envy of any brother artist in the old country. Albumenized paper prepared with 'honest albumen' used quite fresh is a luxury that is worth the journey to New Zealand to enjoy. I believe an egg farm in connection with an albumenized paper factory would be a paying game in Europe. I hope shortly to find opportunity to institute experiment on the subject of real egg albumen paper, and for that purpose I have a lot of paper coming out from England; in the meantime I will keep a careful note of all experience in this direction to communicate with you. If, by the re-introduction of a better class of albumen paper, photographers could regain

the point which they had attained ten years ago—viz., that prints would last many years as good as when done—carbon work would not be in much request for small work."

THE NEW AMERICAN JOURNAL.—The *St. Louis Practical Photographer*, the second number of which has just reached us, fully maintains its promise in every respect. It is well printed, well illustrated, and full of vigour and interest in its literary pages. Its advent appears to be hailed with satisfaction amongst American photographers, as supplying a recognized want. We wish it continued success.

SPIRIT PHOTOGRAPHS.—At the recent National Conference of Spiritualists the subject of spirit photographs received considerable attention, and various cases of portraits produced under test conditions were described. It was admitted that cases of imposture had occurred, but others—genuine. It was alleged, beyond the possibility of a doubt—served to strengthen the claims of spiritualism generally. Mr. W. H. Harrison, Editor of one of the journals devoted to Spiritualism, as a scientific amateur familiar with photography, said:—"My opinion is that although, in exceptional cases, spirit photography furnishes about the best evidence of the truth of spiritual phenomena, in the majority of cases it does not do so, and it is, generally speaking, surrounded by such conditions that the study of it can only be pursued in private. In other words, recognizable portraits of deceased friends, unknown to the photographer—the production of which cannot be accounted for on any imposture theory—are the exception. Unrecognizable and indistinct pictures are the rule, and as these latter can usually be imitated with ease by numerous methods of producing sham ghosts well known to photographers, the medium is safe to be assumed to be a trickster by the public, and when his pictures are genuine the populace will not give him the benefit of any doubt, he will be unable to obtain an honest bearing in the newspapers, and any court of law will pronounce him an impostor. A good instance of the production of a recognizable spirit picture was the case in which Mr. Livermore, a partner in one of the largest banks in New York, went to Mamiel, the spirit photographer in that city, and obtained an unmistakable likeness of his departed wife, who was unknown to the man through whose mediumship the picture was produced. Mamiel was pronounced as an impostor, and the expenses of the prosecution were shifted upon the backs of the public, as usual in these cases; but the evidence was so strong that this likeness did not come through any trickery of his own, that, in spite of all prejudices, the case was dismissed. In England he would probably have been condemned."

CONTRABAND PHOTOGRAPHS.—Photographs passing from Canada to the United States are subject to duty. The *Boston Christian Register* says:—"Nearly eleven thousand photographs of the graduating classes at Harvard, Yale, Dartmouth, etc., were seized while on their way from Montreal to Cambridge. 'The duties would amount to about \$3000.' It is to be regretted that so many of the colleges should apparently lend their countenances to smuggling. We regret exceedingly that the good name of our art has been thus tarnished. We now see why it is that all of our large colleges employ a foreign photographer instead of native talent."

A DOUBLE SALT OF SILVER.—Referring to some recent talk in this country about a "new" double salt of silver, Mr. H. T. Anthony says, in the *Bulletin*:—"As I have had some experience with a double salt of silver and ammonia, which I made at the time the Wothlytype process was in use, I may be able to supply a formula for a salt which I know could be used either for the negative bath, or for silvering paper, without removing the albumen from the paper. The process of making it is as follows:—A silver solution of no matter what strength is made into ammonia nitrate in the ordinary way. To this nitric acid is added until the solution becomes acid to litmus paper. Upon being evaporated it gives very fine needle-like crystals. One peculiarity of this salt is that it is much more readily soluble in alcohol than the ordinary nitrate. To use it for the negative bath it is necessary to add a little nitric acid; for the paper bath, a little ammonia. When the subject of emulsions was started in this country, I gave Mr. Newton some of the salt to be tried with the bromide of silver; but as he never reported results, I suppose he did not succeed with it in that direction." A formula for a similar ammonia-nitrate of silver was given in one of our early volumes, alcohol being used for its solution.—*Ed. Photo. News.*

To Correspondents.

DETA.—Bichromatized carbon tissue is much more sensitive to light than silver albumenized paper. But the book illustrations to which you refer are by a mechanical printing process. It is not only quite possible, but easy, to produce carbon prints with a matt surface. The glazed surface to which you refer is produced as a matter of choice, to please public taste.

A. WISOW.—As a rule, photographers are most busy in fine weather. In London, during the London season, now just commencing, photographers are busiest. A good printer receives pretty good wages, we believe, and a really skilful man is rarely long out of employment.

J. C. S.—The question of what lenses to get entirely depends upon the purpose for which the photographer chiefly intends them. If for landscape pure and simple, single landscape lenses answer every purpose, and that you possess, and mark B, is excellent. If they are required for portraiture, a portrait combination is desirable. If for architecture, then a combination, giving straight lines, is necessary. A single lens, used for architecture or for copying maps or geometrical drawings, will give barrel-shaped curvatures to straight lines occurring near the margin. We prefer Y: H has, we believe, gone out of business.

PRULOMEL.—Aurine is a yellow dye colour, which, it is quite probable, will not be kept by ordinary chemists and druggists; but as it has two or three uses in photography, it is probable you can obtain it of most photographic chemists. The sulphide of tin you mention has no connection with it. The latter is the destructive substance which, when used in bronze printing, produces yellow spots in prints. We do not know the price of the lectures you mention, but believe it to be six shillings.

A. PHOTO. PAINTER.—The print has all the appearance of having been in contact with cards on which the name, &c., is printed with the bronze which is used in "gold" printing, which, coming in contact with a print, covers it with the yellow spots seen on your card.

R. G.—We will endeavour to obtain the information.

B. L. M.—You will find on page 162 of our YEAR-BOOK recently issued a reference to all the articles in connection with carbon printing which appeared in the PHOTOGRAPHIC NEWS during last year, a reference to which will aid you materially in your experimental efforts.

TRAO.—Photography as practically worked in the present day is an essentially English discovery. Fox Talbot's discovery was the basis of all silver printing, and Archer's collodion process is universally used for the production of negatives. Carbon printing was based on Mangel Ponton's discovery of the sensitiveness of bichromate of potash in connection with an organic substance; and although Messrs. Poitevin actually formulated the carbon process, Swan and Johnson actually made it practicable. France has, however, made brilliant discoveries in connection with the art. Germans have worked well in connection with the art, but have not done much in the way of discovery. The same of our American brethren. The first photographic journal was, if we remember rightly, published in America, but of late years their journals have chiefly been devoted to the interests of stock dealers, by whom they have been published.

S. V. writes to inform any of our readers who may desire detailed statement of the mode of working the Wothlytype process that it may be found in a volume published some years ago, entitled "Kingham's Amateurs' Manual of Photography." As we before announced, all particulars were also published in various articles in our columns.

H. KNIGHT.—Many thanks. The letter in our next. The example of emulsifying is very good.

AN OLD PHOTOGRAPHER.—The space we can devote to answering correspondents would not suffice to describe in detail the process of producing transparencies by the wet process, but we have frequently published full details. See an article in our YEAR-BOOK for 1876, p. 147.

A. VICTIM TO AN OLD FORMULA.—We have frequently informed our readers that secret formulae offered for sale might by diligent search be found in our pages; but there will always be a certain number who prefer to pay in preference to searching and trying.

JOHN LITKEN.—Sprinkle the negative skilfully with some whitening about the consistency of cream.

B. E. A.—Our YEAR-BOOK has been published for more than a month. The London agent of your bookseller is, we fear, very negligent. He could have obtained it at our office ever since the first week in January. If you send direct to our Publishers, it will be forwarded at once.

VALENTINE.—As a rule, the black india-rubber tubing is pure, and will not injure nitrate solution. A brown earthenware jar is also safe for silver, if it has not been used to hold anything injurious before; but earthenware is often porous and absorbent.

General Correspondents in our next.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Government Fund for the Promotion of Scientific Research.—The Government Fund of £4,000, for the promotion of scientific research, is to be applied in the following manner—that is, if the recommendations of the Council of the Royal Society are carried out, as will, no doubt, be the case, either in the shape of grants to persons who have done valuable work, or in prizes of considerable value for the solution of problems; again, money is also to be voted to persons desirous of undertaking special investigations, like the British Association and the Royal Society distribute grants; and, finally, it is recommended that some of the funds would be given to mathematicians and calculators employed upon computations and laborious and unremunerative scientific work. This is the sum and substance of what is to be done with the £4,000 which Government has put on one side for what is termed the promotion of scientific research. We have already criticised the subject in this column, and now that the Council of the Royal Society has made up its mind as to the disposal of the funds, we see no reason for changing the view we have always entertained as to endeavouring to promote research by the distribution of money gifts. Candidly speaking, we think the distribution of money in this way will, if anything, have a retarding rather than quickening effect upon scientific workers, and, for this reason, we do not take much interest in the strenuous exertions now being made by the officers of the Chemical Society to accumulate a fund for a similar purpose. Sometime ago, it appears, Dr. Longstaff made a present to the Chemical Society of a thousand pounds, the interest of which was to be paid to deserving chemists engaged in research, and this, by the efforts of some members of the Society, has been increased to upwards of £3,000—a sum which will be still greatly augmented, it is anticipated. Therefore, what with Government aid on the one hand, and private contributions on the other, there is every prospect of large sums of money being amassed for the so-called promotion of scientific research. How much of this money, we wonder, will flow into the proper channels? The poor and needy investigator, to whom, perhaps, a hundred pounds would be a blessing, will never be heard of among the host of more sturdy and pushing applicants; or, if his case is brought forward, the chances are much against his having sufficient influence with the gentlemen with whom the distribution of the money rests. In such a matter as this, we can only judge of what has already been done by the Royal Society and the British Association, and anyone who takes the trouble to go over the list of annual donations and subscriptions paid over by those bodies will find that in nine cases out of ten the money is given to men of science already in the enjoyment of liberal incomes. Sums of fifty and a hundred pounds are voted to gentlemen in affluent circumstances, who, we suppose, spend the money in fitting up a laboratory or in the purchase of apparatus which they cannot make up their mind to buy on their own account. To say such sums promote research is simply absurd, and if their recipient has, in his time, done good work, it has not been owing to any donation he has received. Mr. Perkin would not have been more expeditious in discovering that magnificent aniline colour termed “Perkin’s purple,” we make bold to assert, had he received a hundred pounds during his investigation; and when he had concluded it, the donation of that sum would have had less influence still. If we could suppose a philosopher so destitute as to be incapable of carrying on a research without funds, and could further suppose that his

case would be fairly treated upon the same basis as the case of the fund for the promotion of scientific research. No special fund is required to meet the needs of the fund. And if the fund has the same disadvantages as the many disadvantages to which it is subjected, it sets up at once a crowd of competitors, who are being seen and recognized. The members of the Society intimate that any who wish to apply for money are to make application to the fund, the envelopes being sent to the fund. How will it be possible to sift the applications and flow in, and arrive at the truth. As we have said before, with the gentlemen who have the advantage of the fund will possess the best chance of getting a share. The main portion of the grant will be adjusted in the main, and we shall see some such statement in the papers, and the conclusion of a cattle or fruit show: "A gift of £15 to Mr. Mathematicus, for his solution of the problem relative to squaring the circle." "A gift of £7 to Mr. Hypothenuse, for his work in trigonometrical survey of the moon." Like the great men and bailiffs of great men, our scientific investigators are rewarded with golden guineas, in the same way as they had reared some prize ox, or grown a Brobdignagian cabbage. Do the promoters of these funds think for our moment that scientific men will refuse to investigate unless they get rewards in future, and that the world is in danger of receiving no more inventions like those of the telegraph, the barometer, photography, aniline dyes, gun-cotton, to name half a dozen discoveries at random? Will a paltry fifty or hundred pounds weigh in the least with a man about to declare to the world some grand invention that he has just elaborated? We think not, and, therefore, we hope to be pardoned when we say that the Government Fund for the Promotion of Scientific Research, as well as any private funds of the same character, are very unlikely to produce material good. In the popular opinion, no doubt, such funds are looked upon very favourably. For it is, naturally enough, inferred that the money will fall to needy and deserving investigators, who have spent their whole time and fortune in the interests of the public. Unfortunately, experience has shown that this is far from being the case, and these few exceptional cases will, we fear, be no better off than they were formerly.

Harmless Logwood and Chromate Inks.—Photographers may be interested to know how to produce a durable ink by the aid simply of logwood aided either to chromate of potash or alum. The ordinary chromium and logwood mixture or ink, it appears, though good and cheap, has the defect of depositing black flakes, leaving a colourless stain behind when exposed to air and light. This may be prevented by the addition of a little carbonate of soda. You add to fifteen parts of logwood extract 900 parts of water, and after leaving the liquid some time, decant it. Then heat the solution, add four parts of crystallized carbonate of soda, and, finally, put in, drop by drop, a solution of one part chromate of potash in 100 of water. Chrome-alum is not recommended, as it gives it a depth of colour, and besides involves the use of sulphuric acid, which attacks steel pens. Another ink which may be employed for copying purposes, and in whose composition yellow chromate of potash also enters, is that recommended by Boettger. Thirty grammes of extract of logwood are dissolved in 250 grammes of water, eight grammes of carbonate of soda are added, and thirty grammes of glycerine; lastly, one gramme of yellow chromate of potash and eight grammes of gum-arabic are powdered and dissolved in a little water. This ink is said to be very black, does not mould, nor attack metal pens.

PHOTOGRAPHY FROM A HOLIDAY-MAKER'S POINT OF VIEW.

BY H. BADEN PRITCHARD, F.C.S.*

I MUST ask you to bear in mind that I am writing not as a photographer, but as a holiday-maker, and that the pictures I show to-night are not the results of photography so much as of holiday-making. My purpose is to put before those who can run away from their work for a week or a month into the country, how much they may add to the pleasure of a tour by taking a little camera along with them; but if they do so, let them never fail to remember one maxim: their chief object being relaxation and enjoyment, nothing should ever be permitted to interfere with their personal pleasure and comfort.

I have heard holiday-makers make a good deal of fuss about altering pre-arranged plans. Nothing, in my mind, is more foolish, supposing you are limited by time and money, as to start upon a pleasure journey without some definite idea of what you are going to do; but at the same time if, during your journey, you perceive a method whereby you can improve your tour, then bear in mind that your sole end and aim is pleasure, and do not hesitate one moment about changing your plans, no matter what trouble they cost you to draw up. You have well earned your holiday—let nothing interfere with your enjoyment of it.

So far as I am concerned, I have made most of my journeys on foot, and when it is borne in mind that I have a knapsack to carry, it will be seen that my photographic apparatus must necessarily be a very small one. Of course, when it comes to rough glacier work the guide or bearer will carry most of your baggage, but a pedestrian always finds many rough journeys to be performed where a guide is either unobtainable or undesirable. You want to linger here or there, and go out of your way perhaps to see a view, fill up an hour or two in some pleasant neighbourhood, take a photograph occasionally, and, in fact, be your own master, which is certainly not the case when you are in the hands of a guide, so that there is no alternative, if you want to be thoroughly independent, but to carry your own *impedimenta*. Before I go any further, I ought possibly to explain myself a little better. I wish it to be understood, for instance, that I do not expect you to go into ecstasies about my results. I myself have a very poor opinion of my photographs as photographs. Some of them are simply atrocious; others, again, are only bad. Nevertheless, I am quite satisfied with them. They are to me very bright reminiscences of pleasant journeys I have made. But they will not bear much criticism. That panoramic view of the Dolomites, for example—and I may here remark, by way of parenthesis, that the Warnerke film lends itself wonderfully for panoramas—will be pronounced, I fear, as black as one's hat, and lacking in detail. I admit it; the sun was shining all the time into my camera instead of upon the object. But I could not wait another fifteen or twenty hours till it pleased the sun to turn round. So I did what I could, and that is the result.

Had I written this paper seven or eight years ago, I should have had to enumerate a longer list of photographic requisites than I find now necessary for my work, and should have considered it incumbent on me, moreover, to have said something about the preparation of dry films, for no one for a moment could hope to practise wet-plate photography under the circumstances in which I am generally placed. In my various journeys I have made trial of many different kinds of films. My Norway pictures were taken upon the early Liverpool dry plates, and upon coffee films of my own preparing; such as I should describe as slow and sure. Mr. England's simple and effective collodio-albumen process has given me that Tyrol series, and Colonel Stuart Wortley's uranium plates, the

clear films of which render them specially suited for enlargement, are shown in my Engadine and Yorkshire prints; and, finally, my sketches of the Dolomites were secured last year by the aid of the Warnerke film.

When carrying dry plates, however, even when I limited myself to three or four dozen films upon thin glass, I found it impossible to carry the whole stock and apparatus myself, and some of it always fell to the lot of my companion. It is surprising, indeed, how half a pound more or less tells upon a tired pedestrian on crossing a pass a thousand feet or so above the snow-line, or after a day's tramp across the Yorkshire moors. I am glad, for my part, that my days of journeying with dry-plates are over; in future I shall carry nothing but a little five-inch camera and the Warnerke roller dark-slide. Together they form a most serviceable equipment; they are carried, as you see, in two leather cases slung over the shoulder; their total weight is three and a-half pounds. A tripod, which is, at the same time, a serviceable alpine staff, and a small wide-angle lens of Dallmeyer's, completes the outfit.

But it is not only in respect to weight that the Warnerke film and roller slide have an advantage over dry plates. Anyone who has a practical experience of the plates and the film will acknowledge this. In the first place, in carrying dry plates, your day's allowance, placed ready in the dark slides for use, may either prove too many or too few for your wants. Your provision for the day is four plates, we will say; in the morning you are very chary about exposing them, and the consequence is, that towards evening you are left with one or two unexposed. Or, again, you use all your plates early in the morning, and have nothing wherewith to secure a picture in the after-part of the day. With the roller-slide you may expose in one day two, or twenty plates, just as you please. Again, there is no changing of plates when you get home, and of all the tedious and distressing labours that a fagged-out pedestrian can be called upon to perform, while his comrades are in bed and asleep, that of unpacking and re-packing dry plates, dusting and labelling them, and putting them in or taking them out of the slides is about the worst. It is often, too, difficult to secure a suitable place for the purpose; in Norway, I remember, I was very much put out on this account. I meant to change my plates as usual at night-time, but found I had reckoned without mine host; to my dismay it was as light at midnight as it is in England on a summer's afternoon. With the roller dark slide such difficulties as these fall away altogether.

Although but little practice and experience are necessary in the production of such little pictures as I show this evening, the novice must not imagine that they are to be secured without some care and trouble. Three main points require particular attention:—Firstly, he must know how to compose a picture in his camera, a matters in which he will experience little difficulty, probably, if he can sketch, or has some little knowledge of art matter; in the performance of this operation, he must bear in mind the nature of the lens he is working with, and especially its greater or less intensity to exaggerate the foreground; secondly, he must learn to focus correctly; and lastly, what is most important of all, he must master the difficulties of alkaline development.

It is, indeed, upon the development of his pictures that success or failure mainly rests, and it is due to my especial shortcomings in this respect that my pictures are as bad as they are. There is no short cut for beginners; they must patiently master the subject by practice. In the development of dry plates patience is the greatest essential, and the success that attended Mr. Manners Gordon as a dry-plate worker was, I believe, chiefly due to the circumstance that he sometimes devoted a whole day to develop and work up a couple of plates.

And now some may ask, Of what use is it to go to so

* Read before the Photographic Society of Great Britain.

much expense and trouble when for a few shillings or francs you might have purchased as many pictures as you ever bring home with you? The answer to this is very obvious: the pictures you yourself take are secured from your own particular point of view, and show you the scenes as you yourself, and not other people, have seen them. I could, no doubt, purchase a view of the Gloss-Glockner for eighteenpence, but the chances are I should not recognise the mountain and its glaciers at all, if I did not exactly know the spot whence it was taken. I prefer a hundred times my own little brown-and-white images, each of which carries a distinct reminiscence with it, and has a story of its own. Besides, my negatives will give me enlargements to any size, such as I show to-night, printed in permanent pigments; or I can produce lantern transparencies in carbon, of which I should have been delighted to have exhibited a series this evening if the apparatus for doing so had not been so cumbersome.

When enjoying yourself on a summer's day in some rustic paradise, it is something to know that you can take back with you a reminiscence that will serve to call up the pleasures of your journey once more; to know that you can bring home a cap-full of the bright sunshine with you, stored up in that film you are exposing; to be assured that you have not seen the last of that glittering landscape at your feet, or of that splashing waterfall among the trees, or that quaint, old-fashioned village through which you have just passed.

ON SUBSTITUTES FOR GLASS FOR DRY PLATES.

BY J. H. T. ELLERBECK.*

LIKE many others, I have been searching for a medium or support for collodion films in place of the weighty and fragile glass. The suggestion made at our last meeting I have not been able to try, the requisite materials not being forthcoming. Mr. Warnerke's tissue is, I suppose, one of the best, if not the best, though I did not succeed with it myself. But, as our president observed a month ago, when speaking on this subject, we cannot make it ourselves, or adapt it to our own pet process.

I tried first gelatine, but the development of a collodion film on this is so risky and so uncertain that it was given up, though, thinking of it since, it is probable that if the gelatine was previously made insoluble, this substance might turn out a valuable material for the purpose. Should any feel disposed to try, the easiest way is to prepare the film on glass, and afterwards coat with gelatine, and strip; or gelatine might be coated with emulsion, as suggested by the Rev. Mr. Palmer.

Next I tried paper; but from what I used (double transfer from the carbon process) the film could not be got away—a good thing, perhaps, if the paper itself did not get stained during development. The one I have now to introduce to you is iron, in that form known as ferrotype plate, smooth. In its favour we have lightness, durability, smoothness, and no reflection from a back surface against it, opaqueness and flexibility, both of which are objectionable; but I hope to show how the objections can be overcome, and its advantage utilised. My mode of using these plates is as follows:—Attach the metal to a glass plate, by means of a drop or two of any fluid, to keep it flat and taut; then coat in the usual manner with a washed emulsion. Perhaps it would be better to mention here that in all these experiments I have used Mawdsley's pellicle, but any emulsion or bath process can be employed. However, the plate, being dried and ready for use, can be at once placed in the dark slide and exposed, either above, before, or behind a glass plate, or backed by a piece of wood to keep it flat; for, necessarily, if springs be used direct they will curve

the thin metal. For use in the changing-box, perhaps the best way is to bind it at the back of a thin glass plate with a piece of gummed paper kept shaped and ready for the purpose. There is thus no possibility of sharp edges of glass or metal catching or hindering in any way the passage from box to slide. A slight frame of wood could easily be made of the thickness of glass, which would then be better, and save weight. Of course, if glass is used, a dozen plates would be sufficient on a long journey, as every night the change of the whole could be made without more than fifteen or twenty minutes' loss of time—not more, certainly, than is usually given for the same purpose with ordinary dry plates; while most of the precautions taken may be dispensed with, for there is no chance of breakage, and little light getting in, even if wrapped up in a single piece of non-actinic paper or calico.

On the exposure of these plates I wish to lay most stress. If one is sure of the right exposure being given the development is an almost mechanical operation. Therefore, do not risk a wrong one. Use the actinometer, and the rest is certain. I had one during last summer's trip, and, although carrying three makers' plates, not one was either under or over-exposed when I trusted it.

Next comes the development. Attach the metal again to a flat support, moisten with alcohol, wash, and apply a five-grain solution of pyro. to every five drachms of pyro; add two drops of bromide of potassium (120 grains to the ounce more or less, according as the image has previously appeared, and reflow over). Add one drop of the strongest ammonia, then another drop or two of bromide, and another drop of ammonia. These, after a little application, will give the necessary density. Fix and wash.

When dry, coat with a solution of gelatine, made by softening in water, draining, and dissolving in alcohol. This enables one to get a dry film quickly. Any ordinary solution of gelatine will do as well, but takes longer in drying. One ounce to 3H₂O, and say three drops of glycerine to prevent brittleness. A cut with the knife at one corner and the whole detaches itself at once, and we have a negative with which we can print from either side, or re-attach to glass, if preferred.

The emulsion mentioned above has for this process the objection that you cannot see with absolute certainty what detail or density you obtain, but I do not anticipate any difficulty on this point if the right exposure be given, and the use of the actinometer determines this. Also, other films, whether washed or preserved, may not have this doubt. Indeed, I remember that with Wortley's emulsion, for instance, you can judge of the development as well by reflected as by transmitted light; so that the opaqueness of the support in such a case would not be of the slightest importance. I may also mention that if expense is no object the alba metal plates can be used in place of the ordinary chocolate ferrotype. Thus the development can be watched with ease, but the alba plates are costly.

I do not offer the above as a finished process. It is more a suggestion which I shall be glad if others more competent will adopt and experiment upon, and that in time for summer work. The great weight of glass we have to carry, the risk of breakage, and the dirt of backing, are great drawbacks to a summer's out. My little camera and two double backs with four plates cannot weigh much more than half-a-pound, and would hardly be a hindrance to any, even if climbing the Matterhorn.

Another advantage of negatives thus obtained is the facility given for combination printing and for making panoramic views, two or more gelatine negatives being joined together without the slightest difficulty; or stereos may be cut and transposed without danger. But I am in hopes of finding a better medium for the transfer of the film from the metal, as there is sometimes a possibility of

* Read before the Liverpool Amateur Photographic Association.

the gelatine, if unevenly or too quickly dried, breaking away in parts. This, however, is not an insuperable difficulty, and can be overcome by slow drying and sufficient body. The transfer paper as used by Mr. Woodbury ought to be the best for this purpose. The price, too, is not much higher than the best glass, and the sheets can be used over and over again, care being taken not to bend or crease them. The transparencies shown are done by this method—group of ferns undeveloped, the first I tried; another a fall, torn through haste. The little bridge, the third done, is perfect—perhaps too dense to most minds; but this was done with more NH_3 than I recommend.

Since writing the above I got some of the autotype temporary support (paper), hoping that this would act as a means of transferring the negative from the metal to glass. It will not; but, in the course of experiments, I find that the paper itself forms an excellent basis for the collodion. Stretching the paper while wet on a piece of glass smaller than itself, and turning the edges under when dry, it can be coated in the usual way with the greatest ease; then cut and placed for exposure between two thin glasses as to save weight under glass, and backed by any lighter material. The development is effected as for ordinary plates, and the result can be watched as easily. When dry it can be waxed for use direct, or, if preferred—as in panoramic or stereoscopic views—transferred to glass by means of one coated with bichromated gelatine, the paper negative being “squeegeed” (if there is such a word) on to it after immersion of both in water for a minute. If the gelatinized plate is kept ready prepared this operation may be performed immediately after washing, if satisfactory. This must then be allowed to dry thoroughly, and the paper comes away easily; but the wax on the paper being soluble in ether and the shellac in alcohol, it may sometimes stick to the gelatine too tight. In this case, if the whole be immersed in alcohol for a while, the shellac is softened, and the paper can be carefully peeled off. The negative must then be varnished. I pass some done in this way.

For this method I see no objection. If a non-inverted image is required, you have it on the waxed paper; if this is of no consequence, transfer to glass. I think, also, that this paper may be more strongly recommended for the gelatino-bromide process, though I have not tried it. Water here being only used, the substratums are not affected, and remaining intact will prevent the paper being stained or from sticking to glass.

I have, as I said before, in all the previous experiments, worked only with a washed emulsion, but hardly expect that the washing of ordinary films would have any damaging effect. What will stand development will surely stand the preliminaries. You will notice that the samples shown vary very much—some bad, some good. I have brought failures as well as successes, as there is more to be learnt from the former than the latter. Thus, one of Furness Abbey is torn by taking the paper off before being quite dry.

You will notice in some the brown colour of the ordinary negative; those have not been toned. The torn one just alluded to is toned by chloride of palladium, and the difference you will see is remarkable. There is also the duplicate of this one untransferred to glass, showing the paper stained. This is caused, not by the development, which left the paper perfectly white and clean, but by the toning salt, the paper holding the hypo. so strongly that the usual washing failed to eliminate it; thus the palladium was precipitated in the paper—stains resulting. It does not spoil the good effect of the transferred film, but spoils my bottle of toner. To avoid all evils, I next used the palladium *before fixing*, and with a weaker solution. The result was satisfactory in every respect, the toning solution being quite uninjured, and the print equally good.

I am afraid I have wandered a good deal in my remarks, but this has been written at various times as the ideas cropped up. I ought, perhaps, to have waited until better results had been produced; but I hurried rather that I might obtain the help and suggestions of those who are more able than myself to work out a new process.

THE DUSTING-ON PROCESS.

BY J. CROSTHWAITE.*

THE dusting-on process is one of the many useful and available processes which have, unfortunately, received but little attention at the hands of photographers in general. A process which combines, as it does, facility of production with scope for the introduction of artistic embellishments, either in the finished picture or on the negative for printing purposes, is certainly worthy of attention.

Its artistic value is at once apparent when I state that the effect to be produced in the picture is almost entirely under the control of the operator. Some portions of the picture may, if desired, be left with the smallest trace of colouring matter, and others may be developed to absolute blackness, or perfect opacity.

In making pictures on opal the vignetting may be carried out in any manner desired, and many most artistic effects may be readily produced. A skilled operator may regulate the light and shade, or balance of the picture, in the same manner that an artist does for the purpose of sinking any portion of the figure, or enhancing its value by contrast, with the advantage that, however he may manipulate, he cannot well destroy the likeness.

It is well known that the artistic value of a picture depends, to a large extent, upon the treatment of the background, which must be subordinate, and still tend to give relief to the figure. A badly-managed, monotonous background, devoid of light and shade or gradation, will certainly detract from any merit the picture may otherwise possess. The reply given by Rubens to a person who recommended his son to him as a pupil, by saying he was sufficiently advanced so as to be able to paint his backgrounds, will never be forgotten,—“If he can, my good friend, he stands in no need of my instruction.” So well did the great artist recognise how much painting was dependent upon that feature for its excellence.†

The various ways in which this process may be utilised are very numerous. In the early period of its existence it was principally used for the purpose of producing photo-enamels; but it is now used in various ways—for the production of negatives for printing or reversed for carbon printing by single transfer, for the production of opalotypes, the intensification of negatives, either as a whole or locally, as in the production of skies and atmosphere, or even to the extent of introducing figures in suitable places. But these manipulations require the assistance of an eye capable of judging of the best effect, and that most in keeping with the subject.

The process is based upon the decomposition of organic matter in conjunction with a chrome salt—not by utilising directly the products of the decomposition, but by a resultant action, consequent upon exposure to light. The action is analogous to that upon which carbon printing, photo-lithography, &c., are based, viz., that bichromated organic matter, in its normal condition—that is, unacted on by light—is absorbent of water and soluble, but by being exposed to light becomes non-absorbent and insoluble. Thus, if we take some organic substance of a deliquescent or hygroscopic nature, sensitize it with a chrome salt, and expose it to light, it follows that such exposure will destroy its power of absorbing moisture; but suppose you expose only one half, and keep the other screened, the protected

* Read before the West Riding of Yorkshire Photographic Society.
† Burnet.

portion will retain its absorbent powers. Of this peculiar action the dusting-on process takes advantage.

It will be seen that the exposed surface will be more or less absorbent of moisture inversely as the ratio of its exposure. The parts that have been exposed to strong light through the transparent portions of the cliché will be insoluble; the portions covered by the dense parts will remain in their original condition, while the parts exposed to the intermediate tones will be more or less "tacky," according to the relative density of the cliché in those parts. If a powder in a fine state of division be brushed over a plate thus prepared and exposed, it will adhere to the surface according to the light and shade of the original. Thus a negative will produce a negative, and a transparency a positive.

There are a number of formulae published for the preparation of the sensitive mixture, of which I have tried several, but find I can work best with the one published by Geymet, as follows:—

Water	...	...	...	17 ounces
Glucose	...	...	...	1½ ounce
Honey	...	...	...	8 drachms
Gum-arabic	...	...	...	6 "
Bichromate of ammonia	...	...	...	3½ ounces
Saturated solution	...	...	...

The proportion of deliquescent substance may be varied with advantage according to the season, a greater portion being required in summer than in winter, when the atmosphere is often loaded with moisture. A very useful suggestion on this matter will be found in an article in the YEAR-BOOK for the current year, by A. Cowan, under the title of "A Drop of Moisture on a Dry Subject," in which the writer recommends the use of a hygrometer for ascertaining the amount of moisture in the atmosphere. The less moisture present the greater the difference between the readings of the two thermometers, and consequently, more of the hygroscopic compound is required. According to Geymet a larger proportion of bichromate of ammonia produces increased density; a diminution induces a greyness all over the picture.

Unless you are prepared to do a quantity of work straight away, it is better to make up the compound without the sensitiser and add the bichromate as required, as the mixture will not keep for any length of time. After mixing, filter very carefully, as any sediment or dirt is fatal to perfection in the picture, every particle of solid matter forming a black spot, which, if it happen to come in the light of your picture, is rather objectionable.

The glass, having been prepared by immersion in nitric acid, washed, and allowed to dry, is coated with the sensitive mixture. It is better not to polish the plate, but simply, if you are satisfied as to its cleanliness, to warm slightly brush off the dust, and coat. Here, it is probable, you will feel called upon to utter a few strong expressions, as the solution will doubtless refuse to run on the plate, and, most likely, unless you are careful, you will succeed in sensitising your cuffs or shirt sleeves; but with care you will be able to coat a plate by directing the erratic course of the solution with the finger. It will sometimes occur, during drying, that the solution will suddenly leave some portion of the plate, in which case a gentle rubbing with the finger will generally suffice to make it flow. After coating the plate, return the surplus solution to a second bottle, so as to keep the original solution free from dust. The plate may be dried with a gentle heat over a Bunsen burner or a spirit lamp—the latter, perhaps, being preferable.

When the film has dried quite hard and glossy, it is ready for printing upon. Warm the negative or transparency which you are going to reproduce, and place the sensitive plate in contact. Expose in a pressure-frame. The frames constructed for printing pictures upon opal are very suitable. The time of exposure varies considerably,

according to the nature of the light and the quality of the negative—from a few seconds in direct sunlight to twenty or thirty minutes in a weak light. A cliché violent in contrast will suffice with a shorter exposure, while with a very soft negative the exposure will need to be longer, as, contrary to ordinary printing, the longer the exposure, within certain limits, the more vigorous the result.

The plate, having been exposed, take it into a room having a yellow light, but as much light as you can get, as it is necessary to watch well the development. In taking the sensitive plate from the frame, the picture will be faintly visible; if you have been printing from a transparency the image will be of a negative character, and *vice versa*.

At this stage the plate will be found slightly "tacky" from the moisture absorbed during the exposure, which must be driven off before commencing to apply the powder. Were the powder applied to the plate when in this condition, the result would be a most unsightly patch of colours which could not be remedied.

Warm the plate again, and when dry—which may be ascertained by touching the margin of the plate with the finger—lay it on a piece of white paper, so that you may watch its progress, and brush over it the powder, which must be perfectly dry, with a tolerably large soft brush. Cover the plate evenly with a few rapid motions of the brush, which, if the exposure has been correctly timed, will develop a faint image of the picture. Continue the development, with a circular movement of the brush until the requisite density has been obtained. If the development appear to stop before it is sufficiently out, brush off the surplus powder, and allow the plate to stand for a minute or two to admit of its taking up a little moisture from the air, and proceed again as before. It is possible that this may have to be done several times before the picture is sufficiently developed. Should the exposure have been too long, the picture will not develop well, and will refuse to take the colour except in the deepest shadows. On the contrary, should the exposure have been too short, the picture will develop all over, and have a grey, flat appearance, like a print from a much over-exposed negative.

It is probable that the first few plates may not be altogether successful; but by a careful noting of defects, the operator will be enabled, with a little patience, to produce good results.

After development, comes the most critical period, and one requiring great care and delicacy of manipulation—viz., the fixing. Several methods have been given, but the method I have found most satisfactory is by flooding the plate with alcohol, and then allowing it to dry spontaneously. Now immerse in a weak solution of alum until the yellowness disappears, and place for a short time in clear water, dry, and then varnish as usual if a negative, but if a positive, to be coloured upon, use matt varnish.

This process is, perhaps, most useful for the purpose of reproducing negatives, as the quality can be varied and improved. A vigorous negative may be produced from a thin one, and a soft, thin negative from one possessing too much contrast. The process is well worthy of a trial, as there are so many ways in which a power of this kind is useful to a photographer; for instance, when a large number of prints are required, and there is only one available negative, this method enables the photographer to reproduce the negative quite equal to the original, and, if necessary, even to improve it.

HOURS OF SUNSHINE IN LONDON.—The Astronomer-Royal having undertaken to register the hours of sunshine in comparison with the number of hours the sun is above the horizon, some interesting results have been obtained. Thus the week before last the sun was above the horizon 69.8 hours, but his light was intercepted, and he only shone on London 8.3 hours: four days not at all; Sunday, 6.8 hours, Friday 2½ hours; and Saturday, half an hour.

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MEDALS AND AWARDS OF HONOUR.

It is probably impossible to award honours or distinctions to any series of competitors without producing some disappointment. The Edinburgh Exhibition was confessedly one of the best and most successful photographic exhibitions which have ever been held. Its scheme of awards was very fully debated when first projected, and, even after its first announcement, was modified in deference to certain objections raised. The jury—chosen on a principle to which it would appear impossible to object, so far as securing freedom from bias was concerned—was composed of a number of gentlemen beyond challenge as to culture and fitness. The issue has not, however, given complete satisfaction, as the letters in our columns bear witness. The case unquestionably furnishes a strong argument for those opposed to the medal system altogether. Mr. Neilson, in a very temperate letter in our last, points out that the especially unsatisfactory element in the medal system is, that its issue is *uncertainty*; that the award of a medal merely expresses the opinions of a certain limited number of, it may be well qualified, gentlemen, who may be precisely opposed to the opinions of a number of other equally well qualified gentlemen. This is doubtless true; but this element of *uncertainty* is, unfortunately, a characteristic of all human operations. The system of trial by jury, which is regarded as one of the corner-stones of our constitution, is liable to a similar charge, and it deals not simply with a man's property or honours, but with his life; and "all that a man hath will he give for his life." But it is constantly staked on the opinions of twelve men who are not experts nor of guaranteed culture or judgment. It is true it is their opinion of facts brought before them in evidence, not of the subtleties of art excellence. And this makes considerable difference. But still we think that the element of uncertainty is scarcely a fair argument against the medal system, as uncertainty of that kind is so prevalent in human affairs. Most judicious thinkers regard the decision of a jury of award as that of so many men whose prepossessions and crotchets modify their judgments.

There can be no doubt the medal question is one involving many perplexities. In our own conviction, it is a system which should be, theoretically, good, and productive of good in its operation. Emulation has been generally recognized in the history of mankind as affording a valuable stimulus to effort and excellence; and certain it is that the offer of medals is so far stimulatory that it always secures a better exhibition. But then comes the unquestionable fact that the awards always cause much disappointment and many heartburnings, and often develop "envy, hatred, malice, and all uncharitableness;" and the question legitimately arises as to whether the good or the evil preponderates. There are some eclectics who

believe in the advantages, and think that the evils might be got rid of if a suitable system of appointing the juries of award were adopted. We remember some time ago hearing of a scheme in which the exhibitors themselves were to be invested with voting powers, and the jury selected by vote. Such a mode of electing the jury ought to render open dissatisfaction impossible; but we fear it would not in any degree mitigate disappointment and dissatisfaction; besides, it is open to a serious objection *in limine*. Photographic exhibitions are open to all comers, whether members of the Society or not, and exhibitors are frequently, to the extent of half or more of their number, non-members of the Society. To invest them, then, with voting powers would be practically to vest in them a certain act involving the expenditure of the Society's funds. It would further place in the hands of exhibitors a power of getting rid of some one powerful rival whose work might stand, beyond all doubt or question, far in advance of his compeers, by nominating him as a juror, and so placing him *hors concours*. We fear, however, that the awards of the most perfect jury which could be chosen, selected on principles the most just conceivable, would fail to give universal satisfaction. And we are bound to conclude that if the possibility of producing bitter disappointment, and even, in individual cases, virulent dissatisfaction, be regarded as a serious evil, the only remedy will be to avoid the medal system altogether.

Regarding the question of uncertainty, there is a cumulative method of securing something like certainty. Some of the medallists at Edinburgh have received many medals before, and the cumulative judgment of many juries of award surely secure something like certainty. On those who received their first medals at any exhibition the argument of uncertainty of course rests; but it will serve, in any case, as a strong incentive to further effort, so as to secure an endorsement, as it were, of the first award. In the discussion as to the merits of the gold medal picture of M. Kareline, we have heard none which effectually traverses the decision of the judges. It has not been alleged that some other picture or contributor was manifestly more worthy. It is alleged that M. Kareline's work was daring, startling, bizarre, and altogether unusual in its photographic character; but it is admitted by all that it was essentially artistic—a quality the jury were certainly bound to appreciate. One of the most prevalent sins in photography is the tendency to a commonplace dead level, and an immense sense of relief is found in anything which, being good and picturesque in itself, effectually breaks that dead level.

The renewal or re-establishment of the medal of progress, proposed by Captain Abney at the last meeting of the Photographic Society, seems to afford general satisfaction; but it will, of course, at its award, be the subject of discussions and challenges, as almost all awards have hitherto been. Already two forms of objection have been mentioned in our columns. Mr. Woodbury points out that, in relation to one of the typical cases in which such a medal had been awarded, which was mentioned at the Society—that of M. Rousselon, who received a medal from the French Society for the invention of a system of photo-engraving—an error existed which he hoped would not be repeated in England. No description was given of the method of engraving in question; hence it was impossible to decide whether it was new and really belonged to the medallist or not. Mr. Woodbury proposes, therefore, that no medal be awarded in cases where the process is not either publicly described or patented. A correspondent, whose letter we are compelled to hold over till our next, agrees with Mr. Woodbury as to publication being a condition, but protests against awarding medals to a patentee, who, he alleges, has selected his mode of reward; choosing the pudding, our correspondent argues, he should not be permitted to seek the praise as well. These and other points will doubtless require careful consideration before any award is made, and are worth considering in advance.

PHOTOGRAPHIC EXHIBITION AT AMSTERDAM.

It is the intention of the photographic body in the Dutch capital to organize an international exhibition during the autumn of the present year. The exhibition will open on the 16th September, and close on the last day of October. Photographers from all parts are invited to take part, and the Committee of Organization have requested a co-operation of all the photographic societies of Europe.

The gathering will take place in the *locale* of the Society *Artiet Amicitia*, in Amsterdam. Exhibitors must apply for space before the 15th July. The prints must be framed and forwarded to their destination before the 1st September, carriage paid. The price of exhibits may be communicated to the Secretary, but must not appear on the frames. A Hanging Committee will be empowered to accept or reject pictures.

Medals will be awarded to the most deserving exhibitors as follows—

A gold medal for the most important exhibit in the province of art or science.

A gold, silver, and two bronze medals for the best photographs in fatty inks.

Two silver and four bronze medals for the best carbon prints (chromotype).

Two silver and four bronze medals for best pictures (not enlargements) above double plate size.

Two silver and four bronze medals for best enlargements; originals to be annexed.

Two silver and four bronze medals for the best portraits, irrespective of size. Untouched portraits will have the preference.

Two silver and four bronze medals for the best landscapes, irrespective of size.

Two silver and four bronze medals for the best studies of animals.

Two silver and four bronze medals for the best microphotographs.

Two silver and four bronze medals for the best reproductions of paintings.

Two silver and four bronze medals for the best lenses and apparatus.

Two silver and four bronze medals for the best clichés on glass, and the best transparencies on glass.

Two bronze medals for exhibitors of the most interesting collection of pictures or photographic apparatus, not of their own production.

Letters addressed to the *Amsterdamsche Photographen Vereeniging*, Amsterdam, will have full attention, and correspondents are invited to write either in German, English, or French, or, we suppose, Dutch, although our brethren in Holland are too polite to say so.

So that there may be perfect impartiality in the distribution of awards, the Society desires to have on the jury as many foreigners as possible; and for this reason the Photographic Society of Great Britain and the South London, as well as the provincial societies in this country, have been asked to nominate one of their members to serve upon the jury of awards.

RAPIDITY IN CARBON PRINTING.

THE relative facility with which carbon and silver printing could be carried on has often been subject of discussion. Mr. Higginson, of Southport, it is alleged, can produce a greater number of carbon prints in a day than could be produced by silver printing, and we are assured by excellent authority that this is a fact. The evidence afforded by the following letter will be found confirmatory of the position. Sir Thomas Parkyns writes as follows:—

"DEAR SIR,—Perhaps you would like to know what I have seen to-day in the matter of the working of Lambert's patent.

"Having been told by a very experienced photographer that the carbon process is slow and very uncertain, many proofs probably being spoiled before the right number of

tints could be arrived at, I provided myself with some of my own negatives which the licensee at Salisbury, Mr. Witcomb, had never seen before. This was intended on my part as a challenge, which was instantly accepted. I let him have them the night before, so that he might have the fair opportunity of touching out any little defects from long use—which was only fair, I think.

"The next morning, about ten o'clock, I took a lady to have her portrait taken. Three negatives were produced in a short time, and we then adjourned to the printing department. There I saw my own negatives put into the pressure frames, the tissue put on them, and then exposed. A real boy did all this—I believe he is sixteen; when asked how many tints the two negatives would require, he said one would take two and a-half, and the other three and a-half. This was actually done, and I saw the tints. The operation next to be performed was the developing, which was done in moderately flat dishes made of tin. I am sorry I did not time each process, but it was certainly quick. The heat of the water was gradually increased from about 80° to what you may term *hot* water. The paper tissue soon came off, and the image appeared rapidly after a minute or two of washing. It was then fixed with alum water. The plates were dried artificially but *slowly*; damped again, as well as the transfer paper, which was at once applied, and well aqueegeed, pressed, and so forth; and the whole gradually dried once more. The result was two excellent prints, to which, however, for landscapes, I objected, on account of the brilliancy of the surface, but was informed that this could be remedied by dipping in water.

"The operation commenced by the negatives being put into the printing frames at exactly five minutes to eleven, and the finished prints (all but trimming and mounting) were delivered into my hands at twelve minutes past twelve precisely. I had to walk a mile to this place to show results to friends, have my luncheon, pack one of the pictures on a roller, &c., write a letter as long as this to Mr. George Avery, of Tonbridge, who does my silver printing for me, the whole being ready to be sent down to the chief Post Office, which closes at 2-45, so as to save that mail. I assure you I was astonished at what could be done. I should certainly say that it is the process for any emergency, whether through impatience or necessity. There was no hurry for the portraits taken this morning, so five were sent in time to be posted at six o'clock, mounted and finished. Two other prints of other negatives of my own were nearly done in the course of the afternoon—two views of the Cathedral. The boy had hit the number of tints for each—one, I believe, required seven tints, and the other nine. They were both more dense than those printed in the morning, and I feel convinced that the secret of the successful and unflinching use (almost perhaps) of the system is the knowledge of the density of a negative, and the nature of the light. There was no mistake on this occasion. The prints were all uniform in tone, and the light decidedly bad the whole day.—I am, dear sir, yours very truly,

THOS. PARKYNS."

FRENCH CORRESPONDENCE.

OBTAINING METALLIC SILVER FROM WASTE SOLUTIONS AND RESIDUES—VIRGIN SILVER—PHOTOTYPES AND PHOTO-ENGRAVINGS BY BOUVIN'S METHOD—DR. FAYEL'S MICRO-PHOTOGRAPHS—A SINGLE MICRO-CAMERA.

AN amateur, M. Fleury Flament, of Lille, has forwarded to me a communication relative to the treatment of solutions of nitrate of silver from which it is desired to extract the precious metal. Operations of this kind, my correspondent tells me, have been with him for some time the object of much research, his efforts being principally directed to the suppression of liver of sulphur ordinarily employed, the odour of which is so insupportable. He has succeeded in his object, and has now elaborated a method by means of which he can extract the silver in a state of much greater purity. Nitrate of silver contained in the old worn-out baths, as

also in liquid residues, is first of all reduced to chloride. To do this, the liquids are put into a porcelain dish or basin capable of holding twice the volume; some hydrochloric acid is then added, until no more precipitate is formed. When the latter has had time to fall and deposit, the exhausted liquid is poured away. The precipitate is treated once more with the same acid, but of no great strength (that ordinarily sold will do well enough for the purpose). The chloride of silver is then washed, in plenty of water, until every trace of acid has disappeared, and finally it is pressed between sheets of bibulous paper. One part, by weight, of this chloride, when dry, is then taken, and intimately mixed with two parts of carbonate of soda in a crucible. When, through the action of heat, this mixture is in a state of fusion, there is thrown into the bubbling mass a few bits of charcoal. Ten minutes afterwards the crucible is withdrawn from the fire, and after cooling, there is found, at the bottom of the crucible, an ingot of silver of a chemically pure character. Although M. Flament inhabits a large town, there is not such means of procuring virgin silver as in Paris, and to obtain this, he treats in the fashion we have described nitrate of silver furnished by dissolving silver coins. In this way he produces a pure silver free from any oxide of copper, which is a constituent of all minted money. It is true that these oxides do not dissolve in the water remaining upon the silver, but they have the inconvenience, when in the mass, of preventing any exact weighing being made.

M. Boivin, who is perseveringly pursuing his labours and interesting researches, has written me a description of a very facile process to obtain engraved plates capable of being printed in an ordinary printing or engraving press. Unfortunately it is impossible, so far, to reproduce halftones by these means; but, nevertheless, the process will be valuable for reproducing linear designs and sketches. When it is desired to produce a block or printing plate in relief, a sheet of zinc or copper is taken some three or five millimetres in thickness. After having grained the surface, it is coated, in a warm condition, with a light film of wax. To this film you transfer a carbon print by ordinary means, and having developed it, it is dipped into alum solution, and dried. Then the plate is plunged into some solvent of wax—benzole, for instance—and in this way those portions of the metal surface not covered by the image are laid bare, ready to be etched with acid; the layers of wax and carbon in the other parts are sufficient protection against any mordant that may be used. It need scarcely be said that when blocks for the printing press are desired, a negative cliché must be made use of; while in that produced of a plate to be printed in an engraving press, a positive image must be employed. Nevertheless, an ordinary negative may also be employed in the latter case; only, if this is done after having produced the carbon picture, the plate must be covered with a film of copper by the electrolytic process. The image may be removed by hypochlorite of lime and boiling water, and then the wax with benzole, and finally acid is employed to etch. In the latter case the copper constitutes the reserve, while the bare zinc plate is etched by the acid. The success of this process of photo-engraving is assured, according to M. Boivin, if use is made of very clear negatives, presenting opaque blacks and whites free from fog. It is indispensable, also, that the pigmented tissue has never been exposed to light previously. M. Boivin finds that the employment of wax is more facile than that of asphalt dissolved in the benzole, recommended by M. Markl for an analogous process.

Dr. Fayel presented to the Academy of Sciences, at the meeting of that body on Monday last, the details of a new method of micro-photography. As I know that the readers of the PHOTOGRAPHIC NEWS are specially interested in such matters, I do not hesitate to bring before them the substance of this communication. Dr. Fayel placed upon a window-sill the microscope he employs for the purpose, which had over the top a small wooden box supported on a tripod.

This wooden box is the camera, which can be fitted and removed at pleasure.* By calculation the author had determined, first of all, and noted upon the exterior, the different heights that the camera should occupy, in order to secure enlargements with the various powers employed, the image refracted by the lens being projected upon the focusing screen of the camera of the same size exactly as it is seen with the eye. Matters thus regulated, M. Fayel takes the microscopical preparation it is desired to enlarge, and reproduces and examines it under the microscope; and when the latter has been properly focussed, the camera is put into its place, without touching either the microscope or the preparation, the eye-piece remaining in its place. He brings the lens down to the point corresponding to the scale referred to above, and, without even taking the trouble to look at the image upon the ground glass, he forthwith proceeds to put a sensitive plate into the apparatus. When the exposure is at an end, the cliché is developed in the ordinary way. The advantages claimed by Dr. Fayel for this mode of operating are the following:—(1), It furnishes to the physiologist the possibility of taking a photographic image of any object visible under the microscope, no matter to what scale it is enlarged; (2), it permits the production of an image without touching the microscope or the object or preparation under it—there is no need even to focus after the camera has been adjusted, because this is done automatically, and always remains the same; (3), it yields an image of the dimensions precisely of that seen through the eye-piece; and, finally, it allows one to transfer to a competent operator all the photographic labours connected with the affair. I may add that the micro-photographs presented to the Academy of Sciences as the fruits of this apparatus were of a most interesting and remarkable character.

ERNEST LACAN.

PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

THE INFLUENCE OF MOISTURE ON THE SENSITIVENESS OF PIGMENT PAPER—THE ADDITION OF AMMONIA TO THE BICHROMATE OF POTASH SOLUTION—THE USE OF ALBUMEN PAPER IN THE CARBON PROCESS—A NEW MODE OF QUICKLY DRYING SENSITIZED TISSUE—A NEW RAPID WET COLLODION PROCESS.

The Influence of Moisture on the Sensitiveness of Pigment Paper.—A fact which must have been generally observed by carbon printers is, that the bichromated pigment paper is considerably more sensitive in damp than in very dry weather. This may be caused by slow drying, which, according to the Autotype Manual, produces greater sensitiveness. It is remarked, however, that paper which has been prepared and left to dry slowly in damp weather will, if dry weather sets in, lose considerable of its sensitiveness, although, according to the notion generally entertained, it ought to become more sensitive by keeping. This would lead me to suppose that sensitiveness does not depend so much on the length of time the paper has taken to dry, as on its degree of dampness. It is certainly very plausible to think that the action of the chromic acid is much more energetic in the presence of a certain amount of moisture, and that as a consequence hard and brittle paper will require a longer exposure than limp and flexible paper. This is borne out by experience, not only in the carbon, but also in collographic printing. Adept in this branch have remarked that their plates are almost devoid of sensitiveness if used immediately on their withdrawal from the drying box, and before they have had time to absorb moisture of the air. It is thus a matter of great importance to the carbon printer, in order to avoid uncertainty in results, always to use the pigment paper of the same degree of dryness; this object can be attained by sprinkling the floor of the room when the paper is apt to dry hard and brittle, and by drying slightly before the fire when it is limp and moist.

* A plano-convex lens was situated inside the camera, which could be moved by the aid of a screw.

The Addition of Ammonia to the Bichromate of Potash Solution.—It has been recommended to add ammonia to the bichromate of potash, in order to produce a certain amount of the ammonia salt, which is supposed to confer valuable properties to the solution. The effect of this addition is to deprive a certain quantity of the bichromate of its excess of chromic acid, and to produce, in this way, chromate of ammonia. Now as the neutral chromates cannot be used for sensitizing, and the bichromates only do so through the free chromic acid they contain, adding ammonia is simply equivalent to weakening the solution, and is a very roundabout way of gaining that object. In practice it must be very difficult, if not impossible, to determine the effects of this addition of ammonia; and unless the opinion entertained is based on comparative experiments very carefully made, which is very doubtful, we cannot be far wrong in looking on it as we do on many suggestions and recommendations in other branches of photography which are not based on well-determined facts.

The Use of Albumen Paper in the Carbon Process.—It would certainly be a great advantage to pigment printing if albumen paper could be used as transfer paper in the place of the very unsatisfactory article supplied. To use it as a single transfer paper it would be necessary to coagulate the albumen. But coagulating dry albumen is a fallacy which has been exploded fifteen years ago in the columns of this journal. Neither boiling water nor dry heat, nor alcohol, have the least effect on the dry albumen, and it is found just as soluble in water after having gone through any one of these operations, as before. Metallic salts produce with dry albumen insoluble substances which, for want of a more suitable name, have been called *albuminates*. Such is the case with nitrate of silver. One carbon printer whom we know used to sensitize his albumen paper on nitrate of silver, and fix it in hyposulphite of soda—a course certainly not to be recommended. A ten per cent. solution of a cadmium salt will produce on the albumen paper an insoluble layer, which has the advantage of being but little affected in colour by sulphurous emanations. Such paper can be used in the single transfer process. In the double transfer process it is necessary to have at the surface of the transfer paper a layer of sticky substance sufficiently thick to fill up the cavities of the image; and the layer of albumen is not thick enough for that purpose, so that the brilliant spots produced by want of contact are invariably produced. The only way to make use of it is the following:—Cover the image on the rigid support while still wet with a ten per cent. solution of gelatine, and let dry. Dip the albumen paper in alcohol, and before this has evaporated, lay it down on the image, which has been previously made wet, and ensure contact by means of the squeegee. A much better way, however, is to save your alcohol, and, instead of albumen paper, use plain photographic paper. The result will be better than if the regular transfer paper has been used. The drawback, however, is that the retouching has to be done after the transfer, instead of before.

A New Mode of Quickly Drying Sensitized Tissue.—One of the Messrs. Geruzet, the enterprising Brussels photographers, who have been using the carbon process exclusively for over two years, has communicated to the Brussels section of the Belgian Photographic Association a new mode of drying the sensitized tissue, the value of which, principally in hot weather, can hardly be over-estimated. The tissue, after sensitizing, is laid on a glass plate and deprived of the excess of solution as usual, by means of the squeegee, after which it is immersed for a few minutes in alcohol, and hung up to dry. The drying is done in about half an hour. The alcohol can be used over and over again, until it has taken up too much water. I am informed that the Messrs. Geruzet also make use of alcohol to dry rapidly the prints on the opal glass after developing, and passing through the alum. This mode of operating was first mentioned by Dr. Van Monckhoven in his *Traité Pratique de Photographie au Charbon*. Messrs.

Geruzet's method, allowing the paper to be sensitized a short time before using, does away with all danger of insolubility, and must prove particularly valuable to carbon printers in North America, where the thermometer during the summer months keeps quite steady among the nineties, and sometimes gets up to 110°. The examples of Messrs. Geruzet, who, as professional photographers, would be interested in keeping a good thing to themselves, deserves to be followed by those of the Lambert licencees who are supposed to reserve a few of the most valuable wrinkles for their exclusive use.

A New Rapid Wet Collodion Process.—It is a fact worthy of note that since the days of Archer no marked progress has been made in the wet collodion process. The two great modifications of the process, iron development and the use of bromides in collodion, although they only became of general use in England ten or twelve years later, were known from the start, and were practised to a certain extent on the Continent, and in a general way in North America. The Winstanley method to reduce the exposure to one-half has fallen into oblivion, and if successful has remained a trade secret with a few. The Monckhoven developer, by the use of which a great reduction of exposure is obtained, has a drawback in the production of a muddy deposit at the end of the development. The same objection is raised against the addition of a small quantity of acetate of iron to the developer. In the opinion of many, progress lay in the use of a bromide and alkaline development. This belief, which I have shared, has been a great deal shaken by the examination of several hundred carte and cabinet pictures, the work of M. Boissonnas, of Geneva. The subject they represent can only have been taken with an exposure so short that you may almost call it instantaneous, and what is remarkable, none seem to be underdone. Babies laughing and crying, with hands and feet lifted up; groups of five and six children, some with cat and dog in their midst; cats in the very act of clawing; groups of dogs and cats; an angry cat with its back up, &c., are some of the specimens of this remarkable collection. These pictures were made with the 28 and 38 Dallmeyer lenses in the studio. I am well aware that under the most favourable condition of light, subjects of this kind can be mastered by the ordinary means we have at our command. Mr. Landy, of Cincinnati, exhibited similar specimens in Vienna and in Philadelphia, which attracted general attention. But with him success is the exception; with M. Boissonnas it is the rule, as is proved by the large number of specimens (about 600) in his albums. On enquiry, M. Boissonnas states that the process he uses is the wet collodion process, with modifications in the collodion, bath, and developer; that he uses it for all kinds of work, and has used it for several years. In an establishment where the mode of working of M. Boissonnas was tested against that in use, it was found that it was seven times as sensitive.

Purple Glass.—In H. de la Blanchère's *Repertoire Encyclopedique de Photographie*, published, I believe, in 1862, I come across the following, page 435, §3:—"On a proposé de construire les vitrines des ateliers photographiques en verres colorés en violet foncé. Sans nier que les qualités de la lumière ainsi transmise sont éminemment photographiques, nous pensons qu'il n'y a pas d'avantage à éliminer tous les rayons des autres couleurs, pour la raison qu'ils ne sont pas tous photogéniques au même degré. C'est refuser bénévolement le concours d'aides un peu moins puissants, mais dont le reunion ne peut être nuisible."

Thus La Blanchère, in other words, expresses the idea that the part is less than the whole. It is remarkable how old fallacies are periodically brought up again. We have had the blue light as early as 1853. It was forgotten, and resuscitated in 1862, when it was used by many photographers in the United States—among others, Fredericks, in New York. A variation of it, the violet

light, seems to have occupied attention in France about the same time. After having been buried and forgotten, it is now brought to light again.

CARBON PRINTING.

BY A. WELLESLEY TURNER.*

PRINTING the sensitized tissue for cartes and cabinets can be done in an ordinary pressure frame, a proper safety edge being provided; but as it is usual now, when doing enamelled carbons, to print in an even tint or ornamental design with name, &c., round the picture, a frame or other contrivance specially made for this purpose is necessary; it greatly enhances the beauty of the finished print, and acts as a guide when mounting with high gloss. Those invented by Mons. Lambert admirably fulfil every purpose; but as I believe they are only supplied to his licensees, and are expensive into the bargain, I would advise beginners, to whom my remarks more particularly apply, to construct or purchase tinting contrivances made on a similar but much cheaper principle. It is simply a method of double printing, the only difficulty to be overcome being the fact that we cannot see the print as in silver, so as to adjust it in position; to do this, however, in carbon is, for small work, an easy matter, all that is required being an arrangement cut out of cardboard in the printing frame, by which the tissue can be accurately placed in the left hand top corner, and marked; when exposed, as usual, under the negative, it is transferred to a similar arrangement in another frame used for tinting, in which the same corner occupies a like relative position to that of the printing frame, the part exposed being covered by the opaque part of the second frame, and over the unexposed part there is only a transparent film, upon which the name or other design is generally printed. It is not, however, absolutely necessary to have the tinted edge for mounting with high gloss, as will be afterwards described under that branch. Where the tinting is not required, safety edges must be provided by cutting masks with the cabinet and carte cutter, and attached to the negatives upon which the tissue is placed, and exposed to light for printing.

As the progress of printing cannot be watched as in silver, we must use the actinometer for this purpose, a little instrument, I think, most of my readers must be acquainted with. The small one, for giving separate tints, if carefully watched, answers the purpose well, and is theoretically the most correct; but as it requires unceasing attention, and considerable skill in getting all the tints alike, I would recommend the graduated ones with numbers (called photometers) for greater convenience. With this instrument, when the number to be printed out is decided on according to the density of the negative, it is only necessary to watch till that number shows itself in the proper depth; practice, of course, is the main thing with this, and with the exposure of the tissue entirely. There is very little I could say to those totally unacquainted with this branch of the operations. The trial of a few pieces of tissue will give the beginner a better idea than if I were to write a volume on the subject. It is a thing that must be wholly acquired by practice, but is so soon learned that any one who has printed in carbon for a short time can regulate the exposure of his tissue with almost as much certainty as his silver brother. If ordinary care is used, I can safely say there is less failure in this branch than any other.

The photometer I have found very liable to become discoloured and stained from constant contact with the silver paper. A good plan to prevent this is to glue a piece of mica inside the photometer over the numbers; this will keep the two papers from coming in contact, and, being very thin, does not hinder the numbers showing distinctly.

Different bands of tissue will also be found to vary in their qualities, some being more sensitive than others, by reason of their absorbing more bichromate, or from other

causes, and requiring a longer or shorter exposure to suit them. All these things require watching, and in it consists the skill of printing; but it is surprising how soon experience makes us acquainted with these features of the case, and how easily methods will be found to obviate them. If the printing is undertaken with the photometer by giving it occasional attention, or setting a boy to watch it under your supervision, you can at the same time be—

Preparing the Plates, which form a temporary support for developing the image on. Patent plate or opal glass is used for this purpose (the latter I prefer, as it enables the operator to better observe the progress of development). The most convenient size is 15 by 12, holding four cabinets or eight cartes. Some like to use a plate for each print, but this, in my opinion, makes the process unnecessarily tedious, although there is some advantage in so doing, as the prints can then, if too dark or not, be separately treated to hotter water or longer immersion if necessary; but I have found that with care there is very little danger in developing the number of prints mentioned on each plate, and, in fact, if this could not be done I should myself feel very much inclined to give the process up as a bad job.

The plates should be kept in a rack conveniently placed over a long bench, with a pad of blotting-paper at one end for polishing the plates on, and the collodion, &c., at the other. It should be as large as possible, as plenty of room is a great comfort in working. Under this bench should be one or two drawers for keeping prints, pads of flannel, &c.

The plates are first laid on the blotting pad, dusted, and coated with wax by pouring upon the centre a small quantity of a saturated solution of yellow beeswax in benzoline, and spread as evenly as possible with a piece of clean old flannel. They are all treated in this manner, and returned to the rack in doing a quantity; by the time the last one is done the first one is ready for polishing. If the plates have not been used before, it is well to wax them a second time, or leave it on some time to thoroughly set, and polish with great care, as with new plates. Unless precaution is taken the prints are very liable to stick when transferring.

The plates are now polished, to remove surplus wax, with a large piece of cotton wool covered with flannel, so as to make a soft pad. Rub the plate well and carefully with this, until a fine even surface is produced, free from all streaks of wax; this is a sure sign the plates are sufficiently polished, and are ready for the collodion. When the plates have been once successfully used, they do not require again cleaning, but are simply polished with a soft chamois to free them from dust, &c., unless the plates become too saturated with wax, and small particles is collodion film get attached to the surface; it is then necessary to clean them with flannel and plain benzoline; that however, is not often required.

I collodionize the plates, when polished, with Mawson's enamel collodion. I prefer this to the ordinary normal kind, as it is less liable to remove the wax, and they will consequently bear more polishing if this is used. When diluted it runs pretty evenly over the plate, although collodion does not in any case flow as well on a waxed surface as upon plain glass, and a little practice is necessary to do this without waste. It is well to have two bottles for this purpose—one for holding the collodion, and another with a large funnel in its mouth to receive that running off the plate. It can be returned to the stock bottle and occasionally filtered and thinned with an equal mixture of methylated alcohol and ether. As each plate is coated it is stood up in a convenient place to thoroughly set, and generally by the time the third one is done the first will be in proper condition for washing, which is done by placing the plates in a vertical zinc dish, with V-shaped grooves, made similar to an ordinary plate-box to hold a dozen or more plates. This is filled with water, and kept at the left hand end of the developing sink (to be next described). They are left in this dish till all the ether is thoroughly

washed out, and the water runs evenly off. It will do no damage to leave them in a much longer time, and, in fact, a quantity of plates may be prepared and left in water till required—although I seldom adopt this plan myself, except when more have been collodionized than necessary for the time. On the other hand, to hasten the washing, it is well to place a flexible tube from the water tap into the top of the dish, and a brass tap being in the bottom, a fresh current of water can be passed through, and by this means the plates will be very expeditiously washed.

The next branch of the operations being a most important one (*viz.* the development), I will reserve my remarks on it, together with a description of the necessary apparatus, till next week.

Correspondence

ENAMELLING PHOTOGRAPHIC PRINTS.

SIR,—As many photographers may not have enamel collodion by them, the ordinary negative collodion will answer quite as well for enamelling photographs, besides which there is a great advantage in that it is always found ready for use, or should be so, in every establishment. The following simple method of procedure will be found useful to photographers in a small way, or amateurs who wish to enamel a few at a time, and will give results equal to any. Take of—

White wax 10 grains
Ether, methylated 1 ounce.

Cut the wax up fine, put it into a bottle, then add the ether, and shake up until dissolved. It will form a milky solution, but does not require filtering.

Take a clean glass plate, pour a few drops on to the surface, and polish with a chamois leather until quite bright; then coat with ordinary negative collodion, and when set and hard, which it would be in about five minutes, put into a dish of clean water for about a quarter-of-an-hour, or wash under a tap until greasiness has disappeared. (The washing effectually removes the iodizing salts and free iodine in the collodion). It must then be stood up to dry, the lower edge resting upon blotting-paper, or dried by heat. Take of—

Gelatine 30 grains
Water 1 ounce

Put the gelatine into the water, and let it remain for about half-an-hour, or until swelled, then dissolve by placing it into a dish of hot water, keeping it stirred with a glass rod or spoon; when dissolved, let it remain in the hot water for about five minutes without disturbing it, when a scum will generally rise, which can be taken off by drawing a strip of paper across the surface. It must then be strained through fine muslin into a glass measure previously warmed. Then take the dried collodionized glass, previously warmed over gas or fire, and pour on the gelatine solution about one and a-half drachms to a $4\frac{1}{2}$ by $3\frac{1}{2}$ plate, and guide it over the surface with a strip of paper or camel-hair brush, and place upon a level surface until the gelatine is set, which will take about ten minutes. Then take the untrimmed print and the gelatinized glass, and put both into a dish of water, carefully examining both surfaces for air-bubbles, which must be removed; and when the print is well saturated with water put it, face down, upon the gelatinized surface of the glass (both under water, and drawn out together), then place upon a table, put a clean piece of blotting-paper upon the top, and press down with the palm of the hand until the excess of water is removed; it can then be stood up in a dry place to dry, which will take about a day, and when dried it can be removed from the glass by cutting round the edges with a penknife.

HENRY KNIGHT.

THE GOLD MEDAL AT EDINBURGH.

SIR,—I am not surprised to see, from last week's News, that it has been thought necessary by one of the judges at the late Edinburgh Photographic Society's Exhibition to come forward and try to vindicate their recent decision on A. Kareline's picture for which they awarded him the

gold medal. It appears to me, however, that instead of returning to the subject afterwards, it would have been much better had these gentlemen expressed themselves more fully in their published report, and explained to everybody at once wherein lay the artistic merit and technical qualities of this wonderful picture over all those other beautiful photographs which covered the walls of the galleries. Had the brusque Dr. Abernethy lived to read this report, he would have been delighted with its brevity, and dubbed the judges the most sensible men he ever knew; while Carlyle's condemnation of verbosity, as expressed in his apothegm that "speech is silvern, but silence is golden," is nearly accomplished in this official paper. Scotchmen are proverbial for caution, and would rather hear the opinions of others before they give their own, and hence, perhaps, the tentative character of the report, with its appendix of "more last words." But be this as it may, the thing is settled; the medal is, no doubt, ere this travelling towards the North Pole, and to prove that it has gone to the right place, Mr. Macbeth sets himself to read a paper on Kareline's method of "lighting the sitter," the perfection of which, he avers, is summed up in No. 775. In the course of his arguments he states that artists and photographers admired this picture, but that "visitors to the exhibition unacquainted with the art were greatly disappointed." It would thus appear that if I or any other photographer should dare to differ from Mr. Macbeth and his friends, we shall be denounced as "muffa," and relegated into the company of those "unacquainted with the art." Be it so. I am quite content that my taste should be measured by this standard, and I cannot do better than allow a visitor to the gallery (a stranger to me) to express his opinion—and mine.

Lady (to her friend, *loq.*)—"Why have they given the gold medal to this picture?"

Gentleman.—"Well, I do not know. It is certainly not a pretty picture, but it is said to have some technical quality, which I cannot understand, that makes it superior to all the others."

Sir, I have great faith in the powers of educated visitors to discriminate when inside a picture gallery, and when they almost all agree to condemn a picture, in spite of the golden spectacles through which the judges compel them to examine it, depend upon it—artists and photographers notwithstanding—their condemnation is likely to be just. In this case I accept the public verdict as my own, in view of the many beautiful and more artistic photographs which we exhibited. But while I do so, I would have it understood that I endorse the praise given to Kareline's work as embodying a new "system of lighting the sitter," which will, no doubt, have its imitators amongst us; and had the judges awarded a medal for that gentleman's magnificent portrait of himself, your correspondent would have felt satisfied. I cannot help saying, however, that with reference to the meeting at which Mr. Macbeth's paper was read, and almost the unanimous echoing of his sentiments by the members present, these modern Athenians fell into the same mistake as those who lived long ago in the ancient metropolis of Attica, and spent too much of their time in "telling and hearing of some new thing." Why should the whole night have been devoted to blowing the trumpet in favour of one exhibitor, with the exception of a single blast, which had better been left in the instrument? Were the works of Robinson, Wane, Nisbett, Kosmata, Dupont, and many others, not worth mentioning in the same breath? Surely, as a matter of courtesy and good taste, this meeting of the Society should not have been closed without a recognition of their merits as well as Kareline's. While giving all due praise to the skill and originality of our Russian brother, we should not forget that "lighting the sitter," be it by inverted light or otherwise, is only a means to an end, not the end itself; unless we are prepared to take the low position assigned us by Mr. Macbeth of being mere copyists. This, I apprehend, photographers will not do, even at the

bidding of an eminent artist, but will rather endorse the sentiments of Mr. Tunny, that a "true artist, whether he is a painter or a photographer, will put his mind into his work, and stamp it with his own individuality." With regard to the awards generally, I will only say that some of those gentlemen who received medals were well worthy of the honour. I dare say Mr. Robinson would be rather surprised, and might possibly think it a mistake, as I did, that a medal should have been given him for "His Own Fireside," while "Preparing Spring Flowers for Market," one of the most beautiful works of art exhibited, was passed over, as being less worthy of the honour. One or two of the lucky men could not fail to be astonished when they woke up in a January morning and found themselves famous, and stamped for the next decade of years as leading men in the profession.

Just one word more, and I am done. Why were the exquisite transparencies of Mr. York ignored? In reproducing the treasures of our nation, which have been accumulating for generations past; in placing within our reach transcripts of those places of deep historical interest which are so much bound up with the past history of our national life, so that tens of thousands of the people who are never likely to visit London and its sights can, in their own homes, feast their eyes and store their minds, by and through his efforts, Mr. York is moving on the lines of and developing what I consider one of the noblest phases of photographic science. I think, therefore, the judges would have done themselves honour in bestowing it upon that gentleman, not only for the beauty and permanency of his work, but for its high educational value in relation to the masses; and for them to have lost the opportunity in this case of giving "honour to whom honour is due" was, to say the least of it, a great mistake.—I am &c.

"ONE OF THE VICTORS TO THE EDINBURGH PHOTOGRAPHIC EXHIBITION."

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

An ordinary meeting was held on the 5th ult., Mr. JOHN SMITH, President, in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Shepherd was elected a member.

Mr. J. CROTHWAITE then read a paper on "The Dusting-on Process (see page 100), and exhibited a few specimens of reproductions by that process.

The CHAIRMAN said that he considered the paper a very practical and exhaustive one, and thought the writer had made out a strong case for the process.

Mr. GREAVES inquired if Mr. Crothwaite had tried the process as applied to enlarging.

Mr. CROTHWAITE said he had not, but intended doing so, when he should be happy to communicate the results to the members.

Mr. GREAVES observed that he had tried the formula as given by the Autotype Company in their Manual, but had had great difficulty in getting rid of the yellowness arising from the bichromate. He had tried strong solution of alum and hydrochloric acid for removing it, but had not been entirely successful.

In reply to the Chairman,

Mr. CROTHWAITE said that he had given to the reproductions on the table exposures varying from fifteen to forty minutes. He had found a maximum exposure invariably the best; it simply meant a little longer time in development.

Mr. GREAVES suggested that it would be a very good method of securing vignettes for carbon printing, as the negative might be coated, then printed under an ordinary vignetting board, and developed in any manner the operator thought proper, thus producing a negative that would not require vignetting, but could be printed, like an ordinary negative.

A vote of thanks was then presented to Mr. Crothwaite for his able paper.

Mr. Sachs exhibited a number of pictures printed in carbon, with a surface very highly glazed, as an example of the advantage of slow drying after mounting.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting was held on Thursday, the 22nd ult., the Rev. H. J. PALMER, President, in the chair.

The minutes of the previous meeting were read and confirmed, and Mr. T. Moore was elected a member of the Association.

Notice was given of the intended international exhibition of photographs in September next, organised by the union of Amsterdam photographers.

Mr. J. H. T. ELLERBECK then read a paper "On Substitutes for Glass for Dry Plates" (see page 99). The paper was illustrated by films taken by the methods Mr. Ellerbeck had tried.

The CHAIRMAN also exhibited a negative film which had been produced by gelatine emulsion on a gelatine support. He stated that for small plates gelatine supports seemed to do well, but for large plates he had found a difficulty in preventing cockling.

Mr. ELLERBECK said that using the autotype flexible support that did not occur in working with collodion emulsion, but he intended making further experiments.

A discussion followed as to the most suitable supports for films. Mr. WILSON suggested paper coated with india-rubber dissolved in benzole.

Mr. PHIPPS thought that if albumenized paper was coagulated it would be found available.

The methods of Mr. Woodbury and Mr. Warnerke were discussed, but as the papers used by them were not always to be obtained, it was considered advisable to continue experiments.

A copy of the *Rivista Fotografica Universale*, presented by Cav. A. Montagna, of Mesagne, which was illustrated by an excellent specimen of photo-polychrome, was handed round, and a vote of thanks was passed to M. Montagna. A vote of thanks was also passed to Mr. Ellerbeck for his paper.

The Chairman exhibited an album of photographs containing productions of the London Amateur Photographic Association.

Mr. E. Roberts showed some fine stereo-transparencies obtained by the coffee process, which were greatly admired.

To Correspondents

SUN.—A strong iron developer acts more energetically than a weak one, and permits a shorter exposure. Whenever a short exposure is imperative, it is desirable to use a strong developer—say fifty grains of protosulphate of iron and twenty minims of acetic acid. A strong developer, also, as a rule, tends to the production of soft harmonious negatives, whilst a weak developer tends to produce contrast, hence the strong developer will often correct the excessive contrast produced by under-exposure.

HENRY WILSON.—All intensifiers which pile up the deposit are subject to the defects you name. To begin with, it is, therefore, desirable to use a collodion of a powdery texture rather than one giving a horny film, which readily leaves the plate, and splits, which is somewhat the tendency of that you are using. The application to the film, before it dries, of dilute gun-water or albumen will prevent the splitting and exfoliating.

TRIO.—We will place your letter before the writer of the article. You misapprehend, however, the effect and value of diameter in a lens. It is the angular aperture of the lens which determines time of exposure, and not the diameter of the lens. By the term angular aperture is meant the aperture in relation to the focus.

BLIFFER.—There may be two or three reasons for the film slipping off the plate. The use of a dirty glass will at times tend to this result; the use of a collodion giving a horny film will also tend to the same end; as will, also, the use of an acid bath. One of the best preventives is the use of a preliminary coating of dilute albumen, as we have often recommended in all cases.

LEO.—To retain the full gloss upon enamelled prints, it is desirable to mount them before they leave the plate-glass. Failing that, the only plan to preserve the surface as perfectly as possible is to have a mounting material containing as little water as possible. Glue dissolved in spirit, for instance, answers. India-rubber paste answers also; but it is not a permanent adhesive material. The best mode of securing a good colour in collodion prints is to tone them. A full exposure and rapid development also aid in the production of a warm tone.

W. COLQUHOUN.—The print you enclose—if a photozincograph—is a very good example.

J. L. D.—To intensify or tone with permanganate of potash we have generally immersed the plate in a dish of a ten-grain solution. The colour is a rich deep brown. It has been alleged that it is not permanent; but we have found no failure.

PARFLEXED.—With care it is possible to print from a broken negative without the defect showing much. Place the broken pieces on another plain plate of glass of the same size, and bind them together by placing gummed paper round the edges; then place a piece of tracing paper over the back of the negative. Place the printing frame in a box about the size of the frame, so as to cut off lateral rays, and print only with those which strike the negative perpendicularly.

Several correspondents in our next.

W. & A. G. & S.

The Photographic News, March 9, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE RELATION OF SITTER AND PHOTOGRAPHER—THE LATEST NOVELTY IN APPLIED SCIENCE.

The Relation of Sitter and Photographer.—Photographers would do well if they placed themselves in the posing chair occasionally, and looked at matters in their studio from the sitter's point of view. As a rule, they are too much given to considering things to their own advantage, and, as we all of us know very well, while papers without number have been written on the subject of governing the sitter, very little has ever been put forward as to the photographer governing himself. The sitter objects to the head-rest; do not heed him, but apply it. He prefers a suggestion as to the manner in which his face should be turned; do not notice it, but proceed in your own way. As a favour, he asks to look at the negative; your strict rule is never to show it. And so on in respect to a dozen other rules which photographers have set up for their guidance. Now there cannot be a doubt as to the necessity of regulations, and strict ones, too, upon the subject of photographic portraiture; but a studio is not a private enquiry office, nor a police court. Neither has it anything to do with a dentist's den, as many a sitter has fancied who has been posed in the "property" chair, more sternly and severely than if a dental surgeon had operated. We do not suppose that very many of our brethren act in this way, but still it cannot be denied for a moment that with the public there is a very widespread opinion that having one's portrait taken has something dreadful about it. This is the point we desire to impress upon the photographer: we wish him from time to time to look upon his method of treating sitters from their point of view alone, and to take the opinion of the outside world upon this or that point in his *modus operandi*. It is perfectly certain, for instance, that to take a satisfactory portrait, under most circumstances, a head-rest is absolutely essential; but it is none the less true that, from one cause or other, many of the public have conceived a violent dislike to that instrument. Gentlemen object to the cold prongs coming in contact with their neck just where the hair fails to give protection; and a lady, when brought face to face with the apparatus, intuitively puts up her hand to the back of her head, well knowing that the ugly claws will sorely disarrange her head-dress. In well-ordered and skilfully arranged studios, it may be said, there is not the least fear to be entertained on either score, and this we are willing to believe; but unfortunately sitters have not yet found it out, and are still chary of trusting their persons in the "torture-chamber." Again, though the photographer may be a most skilful manipulator, and also an accomplished artist, he must remember that, rightly or wrongly, people have their likes and dislikes, and to try to overcome any one's pronounced antipathy is a task not likely to succeed. Ladies, as also gentlemen—for young men are apt to be quite as vain as to their looks as any good-looking coquette—very often conceive the idea that they appear well, or at any rate better, from one point of view than from another, and have a special predilection for the depiction of one side of their face rather than the other. As the result of prolonged studies undertaken before the glass, they have come to the final determination that the right side is fairer than the left, that there is a more palpable dimple to be seen, and—and this is generally the most important of all—it lacks a little black mole which is to be seen on the other cheek, ornamenting it like a beauty-spot. The photographer, on his side, perceives at the very first entrance of his model that her nose inclines just the least bit in the world on one side, as most noses do, and, after another hasty glance, uses every endeavour to get his sitter to sit the reverse way to what she had

intended. He is quite sure she will like the portrait when it is taken, and behold! when the print is mounted and finished, it makes a very pretty little picture indeed. But the photographer's efforts have all been thrown away; the portrait, under any circumstances, would never have been satisfactory, for the young lady has been regretting ever since her visit that she permitted the photographer to change her mind. Sometimes, and not unfrequently, too, it is the dress as much as the sitter—we are talking of young gentlemen now quite as much as young ladies—that it is the customer's ambition to have reproduced, and if, therefore, the photographer only pays attention to the head and bust, he will assuredly fail to please. One disadvantage under which the photographer labours, as compared to portrait painters, is to be found in the circumstance that he never has sufficient time to get acquainted with his sitter. It is rarely the model is permitted half an hour's sitting. In first-rate studios, even, appointments are made which permit the sitter but ten minutes, and when business presses, the model is got rid of more speedily than this. It is hardly possible to do justice when taking portraits in this hurried manner, and, we believe, much of the dislike which some people feel to visit a photographic studio is due to the rapid and rather uncereceremonious way in which they are treated. Nervous persons take some time to settle down and acquire their normal state of mind when introduced into a sphere that is new to them, and the fact that they know very well that as they are that minute, so they will appear in their friends' albums for years to come, does not by any means contribute a soothing effect. The photographer does not consider these little matters enough, and, therefore, we say they would do well to change places with their sitters occasionally.

The Latest Novelty in Applied Science.—The latest novelty in the world of science, though it has no connection with our art, may well find a brief mention in these pages. Electric telegraphy and photography, if they have little else in common, are the two most important inventions of the century, and the latest improvements effected in the former science are well worthy to be here recorded. Some months ago, our readers may remember, an attempt on the part of Dr. Stein to photograph sounds was successful, and speculations were rife as to the possibility some day of depicting speech in the same manner. The telegraph, it appears, has now stolen a march upon its sister invention, and the *Boston Daily Globe* of the 18th ult. records the first successful "talk by telegraph." A message, more than a hundred lines in length, was sent from Salem to Boston, a distance of eighteen miles, and the recipient of the message recognized not only the words, but the voice of the sender. Sounds, as our readers know, differ from one another by the number of vibrations they set up. Thus the sound or note of C answers to 260 vibrations per second upon a string, while to produce D no less than 260 are requisite. So that if as many electric signals are sent through a wire, having a magnet at the end of it, in the proximity of which magnet there is a flexible armature or metal bar, this bar will naturally vibrate a corresponding number of times, and be capable of producing upon a proper instrument any desirable sound. In the case to which we refer, an apparatus is employed called a telephone, the invention of Mr. Gixham Bell. A delicate membrane of gold-beater's skin is stretched near the mouth of the speaker, the membrane having a thin strip of platinum across it, which almost touches another strip of platinum. On talking, certain vibrations are set up which move the membrane, and cause the two platinum strips to make a brisk contact. In this way the vibrations are sent through the wire, and on their arrival at the other end they are made to bring into play a sounding instrument which emits sounds according to the vibrations transmitted.

PHOTOGRAPHY FROM A HOLIDAY-MAKERS POINT OF VIEW.

BY H. BADEN PRITCHARD, F.C.S.*

PEOPLE are apt to make comparisons between scenery at home and that abroad, and that there is a marked difference between the green leafy charms of our own island and the grand views of lake and mountain on the Continent no one will deny. Indeed you have but to glance at those Yorkshire and Cumberland views of mine to mark the contrast between them and those of the Tyrol and Italian lakes. I point this out because there are many who vow that the beauties of Great Britain are altogether unrivalled, and these people, as a rule, never tire of uttering the well worn advice to "see your own country first" before you venture abroad. It is doubtless excellent counsel, but nevertheless, one should be cautious in listening to it, for it comes, maybe, from those who are as ignorant of the pretty nooks and corners in our own kingdom, as of the famous scenes on the Continent they are envious of your visiting. Far be it from me to depreciate the rustic beauties of Great Britain. There are no such woody glens, such fresh green pastures, such stately parks, such white cliffs, such purple moorland, such cool shady lanes as in this sweet country of ours; none in which a plesanter holiday can be spent. But because one has a liking for home-grown strawberries and the dotted cream of Devonshire, it is surely no reason why you should feast on nothing else, and eschew altogether such good things as the black figs of Italy and the luscious peaches of France. And it is as idle, to my thinking, to contrast the flavour of these different fruits as to make comparison between Clovelly village and the Rhone glacier, or the leafy banks of Loch Katrine and the blue Bay of Naples. *Suum cuique*, I would say, and there let the matter rest as regards the scenery of rival countries. But as to the advice of waiting to see your own country before setting foot on the Continent, there are many points to be considered. Some of us have not always the time and opportunity, or that urgent desideratum, a balance at our banker's, and under these circumstances it is wisest, I think, to go when one can. Besides, seeing one's own country may mean much or little, according to whether he who tenders to advise has himself travelled far or near. A traveller may be well acquainted with every great city in the kingdom, and yet have seen nothing of the beauties of Great Britain and Ireland. Short holidays, however, are usually more frequent than long ones, and it is only in the latter case that a trip abroad can be undertaken. One more argument may be advanced against confining your early travels at home: unless you journey abroad when young, you can never appreciate fully the pleasure of foreign travel, for not only are you apt to become prejudiced as years increase, but you desire, more than ever, comforts and luxuries, to be without which means simply to be miserable.

I have said that one charm about photographs taken upon a pleasure journey in this way is, that each of them has its own story. I only wish I could tell you some of them, but my paper has already gone beyond the limits I first intended. I will, however, cite two cases. There is a little picture in one of my Tyrol series; it shows a line of travellers steadily pursuing their journey through a waste of snow. The last is a ghost-like individual, and represents myself, for I had to uncap the lens before taking up my post, and the bright reflection from the snow began to act upon the sensitive film before I could assume my position. That little picture was taken at our resting place, and calls to mind a jolly picnic upon the snow fields just above the Pasterzen glacier that flows round the foot of the Gross Glockner, here, a gigantic sugar-loaf of pure

ice and snow. As we rested we could see the whole broad sweep of this glacier, at first dazzling in its whiteness, and then breaking up, as it descended, into huge crystalline masses of translucent emerald. The glacier encircled the rocks at one's feet like frozen billows, and you felt tempted to descend, as it were, to the beach and toy with the glacial water.

A story connected with two pictures in my English series, and I have done. One of these represents a low stone building, and the other a dirty court-yard with a stable and a pump in the foreground. They are photographs of Dotheboys Hall. I was in Yorkshire, footing it over the moors, through beautiful Wensleydale, ascending Hillbrough, and visiting such out-of-the-way places as High Cup Nick, Cauldron Snout, and Conky Bear; and I may here remark that any one who believes it is necessary to go abroad to get away from town and every-day life should cross from the "High Force Inn," in Teesdale, to Hawes and Ilkwater, and he will find a two days' march before him through a district as primitive and secluded as the greatest hermit would desire. During twenty miles of the way he will scarcely see an habitation, or meet a living soul as he traverses the wastes of moorland and savage defiles by which his way passes. From Teesdale I came down to Greta Bridge, Yorkshire, possessed with an ardent desire to obtain a photograph of Dotheboys Hall. To the village of Bowes is a five-mile walk—Squeers and Nicholas, it will be remembered, drove over in a pony chaise—and then the problem was to find out the spot. The good people of Yorkshire are a frank, open-hearted race, but I somehow had misgivings about the inhabitants of Bowes possessing any love for Dickens, after his exposure of cheap boarding schools, and I proved quite right in my surmise. However, by far the greater portion of the villagers have never so much as heard of Dickens, and a deep-set scheme on my part to have a pipe and glass one evening in one of the ale houses, and so get into conversation with the cronies of the place, was altogether unfruitful. The old landlady of the inn was, however, better informed, and after expatiating on the interesting character of the town, the Roman Encampment, the Norman Castle, the grave of the lovers Edwin and Emma, whose story has been sung by the poet, I cautiously approached "Dotheboys." I at once touched an unpleasant subject, and my kindly hostess waxed so wrath about "young Mr. Dickens," that it was only by introducing the Romans again, and interesting myself in a big five-foot wall in the kitchen, which was supposed to date from that period, and which I tapped and examined with the assiduity of an antiquary, that I found myself in smooth water again. I had found out two things, however: the locality of the building, and the fact that the village people looked with no favourable eyes upon admirers of the great novelist. A search in the dark the same night brought me to my destination, and the next morning I made a further reconnaissance. A long, low, stone building, just outside the village, was the spot, and from the Norman Castle, where I took my camera, a good, if distant, view of the front was obtainable without observation. To take the rear of the building it was necessary to be cautious. I fixed on the place for setting down my camera—on a low stone wall—and estimated roughly how much of the building I could get into my picture. I counted the paces to judge distance, and then focussed an object at a similar interval. My plate was put into the camera, the slide drawn, and, accompanied by a friend, we moved toward the building, and set down the apparatus, turning away from it at the same moment, and becoming much interested in a dog-cart standing in the road. Securing this picture made me bolder. I passed the side-door and looked in. It led into a yard showing the back offices, the well or pump that used to become frozen in winter time, and make it necessary, occasionally, to substitute a "dry polish" for washing on the part of the boys. There, too, was the stable where Smike would rub down the shaggy pony. If I could only get a picture of

* Continued from page 99.

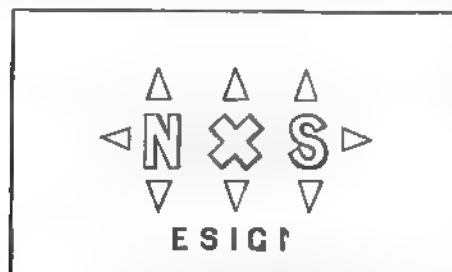
this I should be happy. Some children came out on seeing my companion and myself, and called out, "There's nobody in; there's nobody in." This decided me. I calculated roughly the distance, as before, slipped in a plate, and while my comrade conversed with the children in a moral strain, I placed my camera on a convenient step. Exposure began, and I had just given twenty seconds, when my friend, who had never ceased speaking to the children, whispered in French, "Garde-toi!" I capped at once, and saw behind me a woman approaching up the yard with a big stick. I swept camera, plate, and slide under my arm, and made a clean bolt of it; but the object of the good Yorkshire woman's indignation was not myself, but an unruly cow that had escaped into the road.

MAGNETO-PHOTOGRAPHY.

BY WM. BROOKS.*

FOR many months past I have been experimenting in this peculiar phase of photography, to see if I could corroborate the statements made by Reichenbach in regard to the influence of the magnet on a sensitive photographic plate. I am fully aware that it has been tried by several, and they have given it up. I have spent a great deal of time on these experiments. At first I had nothing but failures, and sometimes only a very faint indication on the plate, although with only gaining this phantom image it gave me encouragement; and now, under certain conditions, I can get an image on the sensitive plate in total darkness in a shut-up box, showing that a sensitive plate is affected when brought within the influence of the poles of a magnet. My experiments I have not yet concluded, and hope at some future time to give a full detailed account (jointly with my friend, Mr. Henry Collen, of Brighton). Our president has this evening asked me to give the results of one or two experiments, as being very peculiar, and at his wish I do so; but at present I cannot invite discussion on the subject, and as I did not intend mentioning to the Society for the present, as I am quite unprepared, not having the plates with me which would show for themselves how far I have succeeded.

I have made my experiments with an ordinary horse-shoe magnet about eight inches long, which I place in a box, poles uppermost, and above the poles a perforated card (about three-eighths of an inch above the poles of the magnet); the card is the size of a quarter-plate, $4\frac{1}{2}$ by $3\frac{1}{2}$, thus—



The letters N S, the cross, and the little triangles are the perforated parts of the card. The part with the letter N is placed over the north pole of the magnet, and S over the south pole. When the card is in position as before stated, the plate is placed one eighth of an inch above the card, making half-an-inch between the poles of the magnet and the sensitive plate. I must not omit to mention that I blackened both the surfaces of the card with Indian ink; not having a brush at hand, I took the solid lump of ink,

wetted it, and rubbed it over the surface of the card, which ground up the surface to a certain extent. Having placed the sensitive plate in its position, I expose in the closed box in total darkness to the influence of the magnet from three to fifteen minutes; the plate is then taken out and developed. Where the perforated parts of the card are sometimes I have developed a negative image, and sometimes a positive image, as if ordinary daylight had had access to the plate; but the strangest part of all remains to be told, and it is this: on exposing one plate, when I developed it, just below the letters N S, and other openings, there was also developed the single line of letters as shown in the diagram of the card, E S I G T, the last being a part of the letter N. I thought this was very extraordinary; no letters were visible on the card; it was an ordinary printed business card that had been used, having all the letters blackened over, and not only blackened over, but ground up by the way I applied the Indian ink; but there were the letters to be seen perfectly sharp on the plate. I looked at the plate and examined the card for a long time, and at last, by looking at an angle across the card, I could faintly (very faintly) see slightly the letters described, but could only see them on the card with great difficulty, but on the plate they were perfectly defined. As the card had been in use for the same purpose some time, I could not remember what card I had used; but after trying what part of a word the letters would form, I found it to be a part of the word designer. I then remembered I had used a business card of a friend of mine. I had several of the same sort by me, and on hunting up a similar card, there was the word on it of the same character of letter. It would have been quite impossible to have photographed those letters on the blackened card with a camera and lens in ordinary daylight, and the fact is that I have not only obtained impressions of the perforated parts without daylight, but I have an impression of an almost invisible image by some means of reflection (for the letters were on the upper surface of the card), and produced without daylight, without contact, and without either camera or lens.

At present I do not offer an opinion on the matter, but only make a statement of the facts as they occurred.

THE COLLODIO-BROMIDE EMULSION: SOME OF ITS APPLICATIONS.

BY P. MAWDSLEY.*

THE first application I will treat of is the adaptability of the emulsion for the preparation of moist plates to be developed in the field. Having recently read a paper on this subject before the Photographic Society of Great Britain, I will now add a few supplementary remarks, with further experience of this method of working.

I see no reason to alter what I said on the occasion referred to, except in a few minor details. For instance: in applying the solution of carbonate of ammonia I think it better to use a small tray or dish, made of any suitable material. I have one of zinc a trifle larger than the plates I work. Into this I put the exposed moist plate, flush it with the ammonia solution, return it to the bottle, and then take on a pneumatic holder and continue development with a solution of pyro in water, restrained, if necessary, with a few drops of a solution of bromide of potassium. When I judge the details are sufficiently out I stop development with a wash of acidulated water. After this, if I choose, I can continue with acid pyro and silver, and when sufficiently dense again flush with the acid water, when the negative may be stored away to be fixed at any convenient time. I have with me a negative still unfixed developed as above.

I will not trouble you with anything further on this subject, but go on to the next application in my paper.

* Read before the South London Photographic Society.

This is the great power it places in our hands for enlarging from small negatives without the usual intermediary transparency. To do this it requires to push development with alkaline pyro until the image is seen to be developed well through. This may be judged of by looking at the back of the transparency, for such it is up to this stage. If it appear sufficiently developed the next step is, instead of fixing with hypo., to dissolve away the image with nitric acid. I use acid and water in equal proportions. The image is dissolved almost immediately, and it has then the appearance of a very delicate negative which will require strengthening, which may be done by exposing it to light, either day or artificial, and the time of exposure is of no moment. Then, having kept the alkaline developer in, flow it over, and allow it to remain on a minute or two, when the result will be a vigorous negative.

I had round an enlarged negative and a transparency, both taken from the same small negative, the only difference in treatment being that one was fixed with hypo. and the other with dilute nitric acid. I have examined both very closely, and cannot detect the slightest deterioration in sharpness from the original negative, which I also had round. The negative has been enlarged about two, and the transparency three, diameters.

From the foregoing it will appear that, when using the bromide emulsion, it is a matter of indifference whether an enlargement be made from a negative or a positive, it being simply a matter for individual convenience. To further illustrate this capability, I had round two 8 by 5 plates, exposed and developed to-day, the one being a negative and the other a positive image.

There is another probable application of the emulsion which at present I do scarcely more than speak of suggestively, and that is the probability of its being used for the production of enlarged paper proofs, which would be valuable in cases where only one or two prints were required. The general defect in developed prints is a heaviness of the shadows, but I believe this defect may be overcome by using a suitable developer; at all events, the only trial I have made seemed to me very promising. There was perfect gradation of tone without the heaviness above mentioned; but, unfortunately, I was called away while the exposure was going on, consequently it was overdone, and gave a flat print. I shall experiment further in this direction, and communicate the results to your Society.

The next application I need scarcely refer to, and that is its suitability for preparation of dry plates. For the production of transparencies for the lantern and stereoscope, Mr. W. Brooks, at the last meeting, read an almost exhaustive paper, and, in fact, appears to have made the subject so completely his own that it is unnecessary for me to say more.

Finally. I may allude to the fact that without the washed collodio-bromide emulsion our esteemed and energetic fellow-member, Mr. L. Warnerke, would have been unable to manufacture the sensitive tissue with which his name is associated, and which for many purposes is of undoubted and great value.

BLUE GLASS IN DISGRACE.

It is not only in relation to photography, as probably many of our readers know, that superior energy is claimed for the light which passes through blue glass over that which is transmitted by white glass: a claim which, in all cases, experience disproves. An article appears in a recent number of the *Scientific American* headed "The Blue Glass Deception." It seems that an American General, General Pleasanton, of Philadelphia, has obtained a patent for utilizing especially the blue rays in curative operations; and the article in question is devoted to an exposition of

the fallacy of the claims made for the blue ray, and showing that light which has passed through violet glass is in no wise different from white light only reduced in power.

General Pleasanton, it seems, states in his specification "that he has discovered 'special and specific efficacy in the use of this combination of the caloric rays of the sun and the electric blue light in stimulating the glands of the body, the nervous system generally, and the secretory organs of man and animals.' He also states that he finds that vegetation is vastly improved by the transmitted blue light.

"These alleged re-discoveries—for the General only claims to have devised the method of utilizing them—were extensively promulgated through the press early in 1871. Subsequently, in 1876, General Pleasanton published a book on the subject, the volume being appropriately bound in blue and printed in blue ink. Recently public attention has again been called to the subject by a New York daily journal. The peculiar kind of glass in question is known as 'pot metal blue,' that is, it is stained a bluish violet throughout, and is not clear glass covered with flashings of blue glass. It is used in greenhouses, &c., in connection with clear glass; and in General Pleasanton's *grapey* it appears that only every eighth row of panes was blue. Some of the results alleged to have been obtained by exposing animals and plants are as follows:—Twenty grape vines, in their second year, after being set out under the blue glass, bore 1,200 lbs. of splendid fruit. A very weak Alderney bull-calf was in four months developed into a strong and vigorous bull. Heifers, when kept under blue glass, may safely bear young when eighteen months old. A weak child, weighing but three and a-half pounds at birth, weighed at the end of four months twenty-two pounds—the light in this instance having come through blue curtains. Two major-generals with rheumatism were cured in three days. A young lady whose hair had come out regained her tresses; and to these must be added various other cures of severe ailments, which we have not space here to recapitulate. The above are the alleged facts; and we propose to consider the supposed discovery in the light of previous investigations.

"With reference to the theories of electricity, &c., advanced by General Pleasanton to account for his phenomena, their absurdity is so complete that we shall waste no time over them. The important question in the matter, and the only one in which the public is interested, is whether or not blue glass is capable of producing all or any of the results imputed to its use. In order to clear the way for the examination of the investigations, the records of which we have carefully collected, let us consider first those which General Pleasanton quotes in support of his views. These are (1) Seenebier's researches, which go to show that the blue and violet rays are the most active in determining the decomposition of carbonic acid in plants; and (2) experiments of Dr. Morichini, repeated by Carpa and Ridolfi, proving that violet rays magnetized a small needle. The first statement has been totally disproved. Dr. Von Bezold, in his recent work on colour, states that 'the chemical processes in plants, as far as they are dependent upon light, are principally caused by the rays of medium and of lower refrangibility. The development of the green colour of the chlorophyll, the decomposition of carbonic acid, as well as the formation of starch, &c., in the grains of the chlorophyll, are induced by the red, green, and orange rays.' The blue, violet, and ultra violet rays, the same authority goes on to explain, influence 'the rapidity of growth, compel the so-called zoospores to move in certain directions, and alter the positions of leaves, &c. In confirmation of this, we have Sachs's experiments in 1872, which show that light, transmitted through the yellow solution of potassium chromate, enables green leaves to decompose over 88 per cent. of carbonic acid; while that passed through blue ammonia copper oxide decomposes less than 8 per cent. This proves the superiority of the yellow ray to

decompose carbonic acid; and this fact Professor J. W. Draper discovered a long time ago by the direct use of the spectrum. In still further confirmation, we may cite the investigations of Voget, Pfeiffer, Selim, and Planchon. The last three have conducted researches in full knowledge of those of General Pleasonton, and their experiments show that yellow rays are more promotive of the evolution of carbon in animals, and its absorption in plants, than any others in the spectrum, the violet rays having least power in these respects, with the exception of the red rays in the case of animals. The absorption of carbonic acid by plants, and its evolution by animals, we hardly need add, are prime essentials to the growth and health of each. The notion that light possesses a magnetizing power on steel was upset by Niepce de St. Victor in 1861. After removing every source of error, he found it impossible to make one sewing needle, solarized for a very long time under the rays of light concentrated by a strong lens, attract another suspended by a hair, whether the light was white or coloured by being made to pass through a violet-coloured glass.

"We can proceed further, and even show that violet light is in some respects hurtful to plants. Caillaud, for example, says, in 1868, that 'light which was passed through a solution of iodine in carbonic disulphide prevents decomposition altogether.' Baudrimont says that 'no coloured light permits vegetables to go through all the phases of their evolutions. Violet-coloured light is positively injurious to plants; they absolutely require white light.' This scientist instituted the most elaborate experiments on the subject, ranging over eleven years, from 1850 to 1861; and the result of all his labour may be summed up in the simple statement that no illumination which human ingenuity can devise is so well adapted for promoting natural processes as the pure white light provided by the Creator. So much by way of general denial of the claims of superior efficacy residing in blue light of any kind.

"Now we have yet to examine the peculiar variety of blue light here used. Sunlight can, by means of the prism, be split into coloured rays, any one of which we may isolate, and so obtain a certain coloured light. Similarly we may obtain light of a desired colour by the use of a coloured glass which will stop out the rays not of the hue required. So that we may obtain violet light from the spectrum or by filtering sunlight through violet glass. When, however, Dr. Von Bezold, as above, asserts that the violet rays have such and such an effect, he means the violet of the spectrum, which has its specific duty to perform in the compound light of which it is a necessary portion. But the violet light of the spectrum and filtered violet sunlight are altogether different things. The first, as our valued contributor Dr. Vander Weyde has very clearly pointed out, is 'a homogeneous colour containing, besides the luminous, the invisible chemical rays without any caloric rays; while the light coloured by passing through violet glass is a mixture of blue rays with the red rays at the other end of the spectrum; and it contains a quantity of the chemical rays belonging to the blue and the caloric rays belonging to the red. In fact, violet glass passes a light identical with sunlight, only much reduced in power, containing but a portion of its caloric, chemical, and luminous agency; being simply deprived of its strongest rays.' And this the spectroscopist has clearly demonstrated. Reduced to its simplest terms, then, the necessary conclusion is that the violet glass acts purely as a shade for decreasing the intensity of the solar light. And in the simple fact that it does so serve as a shade lies the sole virtue (if any there be) of the glass. In 1856, Dr. Daubeny made experiments on the germination of seeds, and in his report is this suggestive sentence: 'In a south aspect, indeed, light which had passed through the ammonia sulphate of copper (blue solution), and even darkness itself, seemed more favourable than the whole of

the spectrum; but this law did not seem to extend to the case of seeds placed in a northern aspect where the total amount of light was less considerable.

"In our next issue, we shall review the effects of light and darkness upon the animal organization, and endeavour to account for the curing of diseases and the production of other phenomena which have been erroneously ascribed to the influence of the blue filtered sunlight."

SCOTELLARI'S METHOD OF LIGHTING WITH VIOLET RAYS.

[Report of the Commission nominated by the French Photographic Society to examine and investigate M. Scotellari's proposal.]

The Commission which you nominated to undertake an experimental investigation of M. Scotellari's method of lighting portrait studios, a method which, in the opinion of the author, should greatly shorten the period of exposure, met, in the first place, at the studio of M. Joliot, whose glass room had been prepared, to the extent of one half, upon M. Scotellari's principle, and illuminated by violet light, the other half remaining in its ordinary state, or, in other words, lighted with white light. Many experiments were made in the presence of the Commission, but none of the results were sufficient to warrant the conclusion that any marked acceleration was effected.

M. Scotellari, having himself made some experiments at M. Carotte's studio, and having stated that his process had the effect of really abridging the exposure considerably, the Commission, in order to convince itself as clearly as possible, paid a visit to M. Carotte's studio, and made some further experiments in that locale. In this case there was indeed a difference to be remarked in the time of exposure in the portion of the studio illuminated by white light and that illuminated by violet rays, to the advantage of the latter. But the conditions of lighting were not identical. That portion of the atelier lighted by white light was opposite a very high and grimy wall, while the half of the studio illuminated by violet light was surrounded with a good deal of clear sky, which fully justified the difference observed in the time of exposure in the two portions of the studio.

As this experiment was not sufficiently conclusive to satisfy the Commission, it assisted at a third trial in M. Liebert's studio. In this case the glass room was admirably disposed for observing the least difference in the two modes of lighting, if it really did exist; but two exposures, conducted with the greatest care and precaution, did not substantiate M. Scotellari's affirmation, for no difference whatever was to be observed between the two results furnished.

In consequence, the Commission regrets to declare that the great desideratum for portrait photographers, an abbreviation of the exposure, is not attained by means of this process.

The Commission consisted of MM. Franck de Villecholle, Liebert, et Ferrier.

ALUM AFTER FIXING.—A printer from Massachusetts gives the *Philadelphia Photographer* a very unfavourable report on the use of alum between toning and fixing to prevent blisters. He practised it for some months about three years ago, and the results have proved most disastrous, the prints having all been attacked in a short time with the worst kind of yellow fever. Some of the prints we have seen are pitiable in the extreme. This printer has made no experiments to prove the alum at fault; but his work, treated the same in every respect except the alum, both before and after using it, shows no signs of fading.

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PICTORIAL PHOTOGRAPHY IN AMERICA.

We have often received from the United States very fine examples of technical photography, and of late years we have received many examples of portrait photography lacking in no form of excellence, presenting fine art qualities, as well as very admirable photography. But hitherto we have seen very few examples of pictorial photography produced in America. We have recently been favoured by Mr. Kurtz, of New York, with a very charming picture produced by photography. It is a large picture, and ambitious in its aim, and is to illustrate some verses by a German poet. It is entitled *Maienacht* (May-night). The lines, which are by George Asmus, run as follows:—

In dunkelfeuchter Maienacht,
Leuchtkäferchen nur glüht,
Verstohle noch manch herrsche wacht,
Was blühe kann das blüht.

Und's mädchen untern Flieder,
Da drin es Hantling baut
Drucht sich die hand aus mieder
Und seufzt enaus halblaut
Ach, wer heint es sohats hatt!

The picture presents a comely German girl standing within a porch, on the damp May-night, looking out into the gloom with a look half of speculation, half of expectancy, waiting for a lover to come. The background, consisting of the porch with lilac growing beside it, is in obscurity, as is also part of the girl's figure, the upper part of which and the head are lighted apparently by an unseen lamp, the picture presenting striking and effective light and shade, the latter prevailing; but perfect breadth is maintained, and the lights are sufficiently carried through the picture by various accessories, receiving light from the same source as the head. The rustic figure, with a pleasant face characterized by unsophisticated simplicity, is admirably rendered; but the charm is in the composition as a whole, which is thoroughly pictorial and poetical, and challenges examination as a picture rather than as a photograph. It gives an impression even to experts that it is a copy of a painting rather than a photograph from nature. After a due examination and appreciation of its pictorial merits, we naturally proceed to scrutinize its photographic characteristics, and there we find sufficient to puzzle and perplex us. The photography is exceedingly good; that is a matter of course in the work of Mr. Kurtz. But here are qualities of texture and handling which are not easily explained. Here are the essentially photographic qualities of drawing and texture, which in the face and some

other parts of the figure permit no doubt that they are really photographed from nature; but in the background and accessories generally, and in many parts of the drapery, there is a peculiar texture which belongs to artistic or artificial handling; a peculiar granulation which unquestionably adds to the artistic effect of the picture; but somewhat difficult to account for in photographic work. The negative has undoubtedly been skilfully manipulated; but the grain or texture of which we speak is not of the character which could be obtained by stippling on the negative. It rather resembles the grain we have seen in Mr. Brown's mezzotint vignette, in which the grain is obtained by double printing from a grain negative. This grain prevails in the backgrounds and in some parts of the draperies and shadowed part of the figure. The face and lighter draperies are quite free from any grain, but possess the ordinary texture of photographic gradation, except that some broad lights are stopped out in the white drapery. In the deepest shadows there is some hatching with an etching point to get deep digs of black. Altogether the picture is an exceedingly interesting photographic study as well as a good picture, and an admirable illustration of the plasticity of photography in the hands of an artist.

PHOTOGRAPHY IN LACE FACTORIES.

In South Germany, we are told, the assistance of photography is aptly made use of in lace factories in the production of *dentelles à l'aiguille*, and at a lecture recently delivered at Vienna by Dr. Martin, the former president of the Vienna Photographic Society, that gentleman gave an interesting demonstration of the art in this connection.

It appears that in this particular description of lace there is considerable difficulty experienced in securing the fabric uniform, some of the work-girls making it too fine and others too coarse. It is made in pieces, which are subsequently fitted together, for it would be practically impossible to wait until one hand had made a piece of sufficient size. A large number of girls are therefore employed on separate parts, which go to make up a perfect piece, and which therefore must all of them resemble each other as nearly as possible.

The ordinary method is to supply the work girls with outline sketches or designs upon straw paper, in which the ground, so far as its dimensions are concerned, is but roughly marked with coloured strokes. Under these circumstances it often happens that the work of the girls varies considerably in regard to the size of the holes and the breadth of the margins, so that there is a want of harmony in a parcel of the lace, a circumstance giving rise to the necessity of carefully sorting out pieces to fit one another, so that no awkward joins may be apparent.

To avoid any such difficulties, it is now the custom to pick out the cleverest work-girl and let her commence upon a design given her upon straw paper. She finishes a piece in accordance with this design, and this well-executed piece of work is then stretched in front of a black background and photographed. The cliché obtained, a Lichtdruck block is produced, and from this a large number of copies are struck off. Each work-girl receives a copy of the photograph, so that not only has she in her possession an outlined design, but the equivalent of a piece of finished lace, which she has merely to imitate, in order that a uniform parcel of work may be secured. A very large number of girls may be employed upon one design in this way, without the manufacturer being under the least apprehension that the many results will vary in character. He can therefore conduct his business with less anxiety, and with the certainty of securing uniform work.

In this application photography appears not merely as a multiplying medium in the matter of design, but as fulfilling an integral part in lace manufacture.

TRANSATLANTIC WRINKLES.

BY LAFAYETTE HARRISON.

No. I.

SINCE having arrived in this country, I have become acquainted with many photographers, and have seen their various manners of working. It would be worse than arrogance for me to say that during this intercourse I have gathered no fresh ideas, or that I have seen no department or operation conducted upon better principles than in America; on the contrary, I have both seen and learned much. But so many suggestions that I have incidentally let drop in conversation have been adopted, tried, and approved by English photographic artists, that I have been requested to communicate some of them to the readers of this journal. Much that I shall herein jot down has appeared before in print (if not in this country, at least in American publications), much is already known, but not universally carried into practice. However, the reader will perhaps be pleased to have them brought once again before his notice, and I doubt not that some few at least will be profited.

Don't be too conservative; give the "wrinkles" a trial. It will pay.

While "out West" last summer, I received a letter from a London photographer which amused me, for it detailed a discovery made by an eminent artist, which had been in daily use, in almost every studio in America, for many years. It was an idea for copying or enlarging photographs (silver prints) without showing the grain of the paper. It is quite simple.

Soak the print to be copied in water. Place a clean negative-glass in a printing-frame. Lay the wetted print face downwards on the glass. Insure perfect contact with a squeegee. Behind it place some moistened blotting-paper. Put in the back of the frame, fix it up, and copy *through the glass*, and you have a copy as good as the original—free from granularity—right away.

That which has struck me more than all else has been the remarkable pertinacity with which English photographers (even the best) stick to the old-fashioned method of polishing plates, in lieu of using a substratum of albumen for the reception of the collodion film. The invariable pleas against the introduction of this system are:—"You cannot get operators to be careful enough. Dust, &c." Now really this is all humbug. Whosoever has skill enough to polish a plate can albumenize one, and if there is too much dust in your dark room (where the operation should be performed) to albumenize plates, I pity your negative bath. Albumenizing, according to the various plans usually published, is, I admit, a nuisance, but if you will follow my directions, the plan generally in use in America, you will not only find it free from difficulty, but will also reap these advantages:—1st. You will save *time*. With a little practice anyone can albumenize at double the rate of polishing. 2nd. You will save *money*, for by this system you can procure better negatives—chemically faultless—without a stain or pin-hole, if your bath be in order, on ordinary glass, which will cost you only a *trifle more than half* the price of best polished.

These advantages, together with all of those which naturally attend them, are of such importance that they must commend themselves to every photographic artist who reads this paper. Once more, gentlemen, do not be over conservative, give it a fair trial, and I guarantee that you will never more of free will have a polished plate in your establishments.

Take the yolk of one fresh egg. Put this in a wide-mouthed ten-ounce bottle together with some clean broken glass, and agitate until the albumen is well frothed. Fill the bottle with ordinary cistern water. Add from eight to ten drops of stronger water ammonia, and the solution is ready. No filtering is required. Keep a porcelain or

glass dish containing strong solution of commercial nitric acid and water, in which place overnight the prints required next day. When about to albumenize, set a smooth board beneath the tap in your dark room, and let a small stream of water run. Now take a plate, place it flat upon the board under the running water, and scrub it vigorously both sides with a small brush (one of those common wooden-backed nail-brushes, sold at sixpence, will answer admirably). When thoroughly cleansed, rinse well beneath the tap, and while wet flow the plate on the concave side (few plates are perfectly straight—ascertain the side by looking along one edge longwise) with the albumen solution. Then quickly rinse the back of the plate beneath the tap, and, turning it over, let one small wave of water run across the face—that albumenized. Now set it briskly in the rack, to let it drain and dry, and proceed to the next. When dry, stow them away in plate-boxes, and use as required. That is all.

I have given a full and somewhat lengthy description in order to ensure being understood. Analyse it, and you will find there is no trouble in it. Try it, and you will prove that it realizes all that has been promised for it.

The albumen solution keeps good as long as it smells of ammonia; if it grows faint, add more ammonia. But if there is any doubt as to whether it is good or not, throw it away, and make some fresh.

These plates, thus prepared, will keep very well for a few days; but if they are not required for immediate use, make the albumen solution as follows:—The yolk of one fresh egg, frothed as directed, to twenty ounces of water and ten drops of ammonia. Filter. Proceed as before, only after flowing the plate with the solution, set it *at once* in the rack, without either rinsing the back or flowing the face with water. When dry, pack them together with clean blotting-paper between each (albumenized sides all one way), in parcels of (say) twenty-five. Let the outer covering be stout brown paper. They will keep for months. Enough for summer use can be prepared during the slack winter season.

I will conclude this first paper by giving the formulæ of, perhaps, the best iron intensifier known. No fear of fogging, and in every way commendable. Of course, in America, we seldom need to have recourse to intensifying, except in the case of children and animals, and even then but seldom, the light being clear and good. But in England—or, let me say, London (for that has been England to me so far)—an intensifier is an absolute necessity in every photographic studio. Here it is. Try it:—

Saturated solution of iron	...	2 ounces
Citric acid	...	2 "
Distilled water	...	40 "

IS A LICENSE FOR CARBON PRINTING WORTH HAVING?

MR. A. HESLER, an experienced professional photographer in America, writes as follows to *Anthony's Bulletin*:—

I am constantly receiving letters with about the following questions, asked for me to answer; and it has occurred that I could best reply to all through the medium of your columns.

1. What do you think of the carbon processes as demonstrated and patented by Mons. Lambert?
2. Does he not give you the demonstrations before you pay the money? Did he do so in your case?
3. Is the process as well adapted to C.D.V. work as silver printing, and are the results better?
4. Can any man be master of the process after seeing it worked only once?
5. Does it not take from three to six months before a man can turn out first-class work?
6. Can it be worked successfully in warm weather?

7. Does it do away with so much retouching as Lambert claims?

8. Do not the Lambertype enlargements look spotted or blurred, as silver enlargements do?

9. Do you use it now for all styles of work in your gallery?

10. Is not the price asked exorbitant?

11. Will it pay in a country town of three thousand inhabitants?

12. Will you send me a sample print?

To which I now make reply:—

1. It is to me exceedingly interesting, and the results very beautiful.

2. I was given to understand that the pay was required in advance, and I took the hint and paid accordingly.

3. At the present price of material it costs more than silver prints; and, in a small way, a man cannot make as many card prints with the process as by silver printing. For strong negatives the results are better than silver; for weak negatives, not so good.

4. No man can be master of any process in our art by simply seeing it done once; but having seen it demonstrated by competent hands, a man may go on and master the process by himself, and his success will be according to his ability to excel in other branches of our art.

5. After two weeks' practice I made prints that were pronounced by competent judges in Philadelphia as the very best they had seen by the process.

6. I have not yet worked it in the hottest summer weather; but I keep my rooms at from 69 to 80°, and find no trouble on the score of heat.

7. Lambert is an expert at dodges, and, for enlargements, his plans effect a great saving of time; but for small work, the finer and more artistically the retouching is done, the better.

8. No.

9. No; not as direct or double transfers. It is at present too much trouble to make people appreciate the difference, and pay the advanced price over silver prints; but for porcelain or window transparencies, and for framing—left on the glass, not transferred, but backed up with the porcelain transfer paper, and delivered ready for framing—people will appreciate them and pay a good round price. I get from ten to fifty dollars each for such.

10. I am perfectly satisfied with the investment I made; but I believe very few who have invested have made the application of the process that I have.

11. It has paid me many times over already. The population of this town is about three thousand; but I got some customers who came up from the city, twelve miles away.

12. I cannot afford to send samples for nothing, but will do so to any one enclosing fifty cents, with the request.

In the above I simply give my experience as far as I have gone with the process.

THE PHOTO-LITHO. OIL PAINTING, OR CHROMOTYPE.

BY I. M. VAN WAGONER.*

TAKE an unmounted print, wet it, and brush over a solution of isinglass made in the proportion of one teaspoonful to half a cup of water; lay it on the glass and rub out all air-bubbles (the same as you would to make an old ivory-type), and let it dry. Now fill the glass that your plate is on with castor oil, letting it stand until it is perfectly transparent, which will take from three to twelve hours, according to the paper the photograph is on. When transparent, rub off all the oil from the picture, which is ready for painting. Now colour the eyes from behind the photo., and then lay it on a piece of white paper to see if you have the right shades (use a retouching frame to colour

the photograph on); next the hair, very lightly, then the jewellery; also all whites that you wish to make resemble lace or white work. Now put over the photograph, on the back, a second convex glass, and fasten the edges with sticking paper; now mix the flesh-colour and paint all over the face. Then paint over the hair, to make it the shade desired. Next comes the drapery: paint it over the same as you would the face, and you can get as beautiful, soft, and rich colour as you desire. When painted, back with white cardboard.

Some people use starch for mounting the photograph, and paraffin for making the picture transparent, which is the mineral process claimed by some to be permanent. The prices charged for colouring these pictures in the city are \$3 00 for C. D. V.; \$5 00 for Imperials, and \$10 00 for eight by tens.

Correspondence.

PROPOSED MEDALS OF PROGRESS.

SIR,—In your last issue, Mr. Walter Woodbury, referring to the proposed medal of progress, suggests that such awards should only be given for "published or patented processes." May I be permitted to suggest a closer limit, and urge that they should only be given for processes or discoveries freely published, and in no case to discoveries or things which have been patented? I do not wish to condemn the patenting of a discovery, but simply to point out that where a discoverer patents his novelty, he chooses his own form of reward; he hopes to receive a commercial recompense, and is in his perfect right in so doing. But he should be content with this, and content with the disqualification it involves in a contest for honours as well. That the process should be made public ought to be imperative in a contest for honours. In the case of M. Rousselon, I believe he got a medal for simply showing results, which might, for all the jury knew to the contrary, have been produced by some one else. If he had described the process, as I think he was bound to do, the method might probably have turned out to be that which Mr. Woodbury communicated to him.

March 2nd.

ARGUS.

UGHT PHOTOGRAPHERS TO UNDERSTAND CHEMISTRY?

MY DEAR SIR,—Will you allow me a space in your paper for a few words as regards the above heading: viz., Ought Photographers to Understand Chemistry? I have read in a book on photography—and it was one of the best—that a knowledge of chemistry was not needful to the photographer. But, in my opinion, the writer was quite wrong, and I think a knowledge of chemistry would be one of the greatest boons to the photographer (however slight his knowledge might be). Now I have no doubt that twenty photographers out of twenty-five have not the slightest knowledge of the chemicals they work with. The photographer of course knows that the iron developer is a reducing agent, but he may not know why! He knows it brings out the image—that's enough for him. Now I think if he knew a little more on the subject of chemistry he would not have half the troubles that beset the photographer. Another instance: Bath works perfectly, but for some reason it gives imperfect plates. The photographer who does not understand chemistry is at a loss to account for it. But if he understood chemistry he would be at once able to remedy the horrid bath. And so it would be in all his photographic occupations—if he understood chemistry the slightest bit in the world, he would have ten times less bother than he

* *Anthony's Bulletin*.

had when he knew no more about it than the man in the moon (but perhaps he may, so we will say a deal board).—
Yours truly,
C. R. F. VERNON.

Grafton, Underwood, Kettering, March 5th.

[There cannot be a moment's doubt, we think, as to the advantage of some knowledge of chemistry to a photographer. He should at least know something of the chemicals with which he works, and of the chemical reactions involved in the processes. It is true that without this he may carry out the operations in a mechanical sort of fashion; but an intelligent man will rarely be content with such a position. We have always strongly commended Captain Abney's Instruction in Photography because, in addition to a description of the operations, he at the same time describes the chemical reactions which take place in each.—ED.]

EDINBURGH PHOTOGRAPHIC EXHIBITION.

SIR,—Gentlemen who consent to act as judges at photographic exhibitions would not need to be thin-skinned, as no matter how eminently qualified they may be for the work, or how thoroughly to the satisfaction of the great majority, both of exhibitors and the general public, their duties may be discharged, they, apparently, must lay their account to be hauled over the coals by a discontented minority, each unit of which, confident in the superiority of its own judgment, does its little best to show up the failings of the greater men. To fair, open criticism there can, of course, be no objection, so long as the opinions expressed are based on known facts; but, as a rule, the critics to whom I allude give rein to their pens inversely in proportion to their acquaintance with the subject, and so convey a false impression to those who may be unacquainted with the circumstances.

We have an example of this—in a very mild form, it is true—in the letter of "One of the Visitors to the Edinburgh Photographic Exhibition." He seems altogether to have misapprehended the nature and scope of Mr. Macbeth's paper; but with that I do not care at present to bother your readers, and mean only to notice the concluding paragraph of his letter.

After a well-merited tribute to Mr. York and the valuable and beautiful lantern pictures with which his name has long been identified, he says, "I think, therefore, the judges would have done themselves honour in bestowing it" (whatever that may mean) "on that gentleman." I suppose I may presume that the "it" refers to the medal awarded to Mr. Ganz, of Brussels, and that "One of the Visitors, &c.," thinks it should have been given to Mr. York.

In the production of lantern pictures Mr. York is *facile princeps*, and by none are his works more highly admired than by the members of the Edinburgh Photographic Society, at whose popular evenings they have often played so conspicuous a part. But if "One of the Visitors, &c.," was also an observer, he will be aware that no medal was offered for lantern pictures—the wisdom of the omission is a different matter—and must have seen the beautiful series of large transparencies, about twenty-four by twenty, exhibited by Mons. Ganz, generally surrounded by numerous admirers, and, therefore, ought not to have confounded things that differ.—I am, &c.,
JOHN NICOL.

RAPID CARBON PRINTING.

DEAR SIR,—On reading the letter of Sir Thomas Parkyns, describing the extreme rapidity of the carbon printing process as practised by Mr. Witcomb, I was much puzzled to account for the slowness of my own method. Sir Thomas states that between five minutes past eleven and twelve minutes past twelve—that is to say, in sixty-seven minutes—he saw Mr. Witcomb print three portraits (one of which took $3\frac{1}{2}$ tints to expose) in carbon. In the time was

included every operation up to the finished result, during which they had to be dried slowly. I tried the experiment of putting out my actinometer, and printing three tints, and noting the time consumed—viz., one hour and thirty-five minutes; this on a moderately dull day.

Another matter I should be glad to get some information on is the best method of applying the transfer paper to the picture developed on the collodionised glass. My great difficulty is in getting the paper to accommodate itself to the high relief of the gelatine film, which, when dried, shows a number of glossy specks, particularly round the edges of ovals, &c.—I am, dear sir, yours, &c.,
H. W.

FRESH ALBUMEN.

DEAR SIR,—Respecting Mr. N. K. Cherrill's remarks on the above subject in your issue of the 23rd of February, I beg to remark that I have had at times over one hundred heads of poultry to try the difference between albumenized paper prepared from new laid eggs and that prepared from "good French eggs," but there was no difference in the results when using only the clear albumen from foreign eggs, and this is what I have been using of late years, guided by an experience of over eighteen years. Nevertheless, I shall be glad to know the results of Mr. N. K. Cherrill's experiments.—I remain, dear sir, yours faithfully,
ANTHONY RIVOT.

Willenden Green, N. W., March 7th.

Proceedings of Societies.

REPORT OF THE COUNCIL OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE proceedings of the Photographic Society of Great Britain for the past year have been characterized by a steady progress in the work which should be the real object of its existence—namely, the study and advancement of photographic art science by individual thought and collective deliberation; at the same time it must not be overlooked that the state of transition which some branches of photography are now experiencing must of necessity prevent much of that investigation into its strictly scientific aspect which might otherwise be undertaken, and limits the probabilities of making new discoveries, which is the part of this Society to afford its members opportunities to discuss.

As an example of a branch in a state of transition, we may instance the gradual departure from silver printing to the production of permanent photographs, which forces itself upon the attention of all who desire that "a thing of beauty should be a joy for ever." Such a change as this necessitates the individual photographer experimenting for himself in private, and hence he is not in a position to assist so much in the collective public work of a society, and thus it follows that the publication of new ideas, or any practical research, becomes vested in a comparatively few workers. Your Council cannot but express how much they feel the Society is indebted to those members who have, during the past year, laid before them some very important and valuable discoveries and investigations; and whilst stating this, they would still desire to remind any member who may have remarked anything that is new or different in his idea to what others have done—however small or apparently unimportant—that it almost becomes a duty to lay the same before his fellow members, so that fresh minds may be stirred up thereby to new efforts of research.

To meet the necessities of the time, your Council have considered the advisability of devoting some of the usual monthly meetings to a simple discussion upon various known subjects, upon which a paper, being more formal, might be found to be not so well adapted or necessary. The value of such evenings consists in many persons being able to make observations, arising from their previous individual knowledge, which is difficult, if not almost impossible, to be done when a paper is read upon a new subject. The experiment has already been tried upon one evening, and your Council has every reason to be gratified with the result; and to indulge in the hope, that when more properly understood, these discussions will become a most valuable phase of the Society's work.

Your Council must congratulate the Society upon the increased attendance which has taken place at all your meetings during the past year. The opportunity afforded for the inspection of the works of fine art in water colours which adorn the walls of their present place of meeting not only adds brilliancy to the gatherings, but, whilst affording examples of study, must greatly increase the pleasure of those present.

Fourteen papers have been read before the Society since last February, at eight meetings (including this evening) as follow:—"Further Researches respecting the Influence of Various Bromides on the Collodion Emulsion," by Leon Warnerke; "Note on the Production of Antimony Photographs," by John Spiller, F.C.S.; "On the Measurement of the Actinic Value of Sunlight," by Captain Abney, R.E., F.R.S.; "On the Preparation of Sensitive Dry Pellicle from Collodion and from Gelatine," by Colonel H. Stuart Wortley; "Note on a Dry Plate, exposed and developed Fifteen Years after its Exposure," by Wm. Brook (Bretford); "A Novel System of producing large Panoramic Negatives by Means of Ordinary Small Cameras and Lenses," by Leon Warnerke; "On some New Facts in Support of Dr. Vogel's Colour Theory," by Captain J. Waterhouse, F.R.A.S.; "Note on the New Nitrate of Lead and Ferricyanide of Potassium Intensifier," by Captain J. Waterhouse, F.R.A.S.; "Notes on a Tour in South Italy," by the Rev. W. A. Crofton Atkins; "On Stereoscopic Botanical Subjects," by F. H. Worsley Benson; "On Photographic Operations in the Recent Arctic Expedition," by Captain Abney, R.E., F.R.S.; "A New and Simple Method of Working in the Field," by Peter Mawdsley; "Note on the Reticulation of the Film in Carbon Printing," by H. Baden Pritchard, F.C.S.; "Photography from a Holiday-maker's Point of View," by H. Baden Pritchard, F.C.S.; and a Discussion at one meeting upon "Carbon Printing."

It is with feelings of regret that your Council feel called upon to record that the Annual Exhibition held during the past year was not so successful as might have been anticipated from the success attending the previous display, and, although it remained open for a longer period than any of the former exhibitions, the attendance was not in any way commensurate.

Your Council would also beg to remind the members of the Society that it is only by united strenuous efforts, in annually providing the various works for exhibition, that the progress of the Art-Sciences can be made known to the general public, and hence when any particular falling off in the character and number of the works exhibited is made evident, every individual member must, to some extent, feel the reaction arising from the reduced interest shown by the outside world. But your Council will take into consideration the causes which have led to this want of success, and consider the best means of securing, amongst other things, an exhibition of a more international character, in the coming season, and of enlisting in its support the practical aid of a wide circle of photographers.

The following analysis of the Exhibitions, made again this year by the Assistant Secretary, is appended, as a record of facts, which becomes desirable and interesting, if only from a statistical point of view:—"There were 78 exhibitors; of these 37 were members, and 41 non-members. Of these 78 exhibitors, 34 were from London and 44 from the country. Of the 37 members, 17 were from London and 20 from the country. Of the 34 London exhibitors, 17 were members and 17 non-members. Of the 44 country exhibitors, 20 were members and 24 non-members. 852 frames were hung; of these 189 contained 407 separate pictures of landscapes, architecture, animals, and flowers, and 163 frames, containing 584 separate pictures of art studies and portraits.

Amongst the 852 frames are included 53 containing enlargements, comprising 35 portraits and 18 landscapes and architectural subjects. In all, 941 separate photographs, besides 52 negatives and 40 transparencies.

In conclusion, your Council hope that the hearty co-operation of all the members of your Society will be given towards the advancement of both the scientific and art-side of photography, and that the forthcoming year may be rich in valuable communications, so that the prestige of the Photographic Society of Great Britain may be worthily sustained.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual meeting was held in the Room of the Society of Arts, on the evening of Thursday, the 1st instant, the Rev. F. F. SEATMAN, M.A., in the chair. The minutes having being read

and confirmed, the following gentlemen were duly elected members of the Society:—Messrs. F. D. Lavendar, C. Bennett, and W. Adkins.

Mr. W. Brooks then brought before the Society briefly some recent experiments he had recently made in connection with "Magneto-Photography" (see page 111). Some conversation followed; but in deference to a protest from Mr. Taylor, who remarked that until they had the subject properly before them it would be inopportune to open a subject which must lead to a protracted discussion, its further consideration was postponed, until Mr. Brooks was in a position to bring the subject before the Society in a completer form, when an evening would be devoted to the subject.

Mr. MAWDSLEY then read a paper on the subject of "Collodion-Bromide Emulsion" (see page 114). Some interesting specimens were handed round for inspection.

Mr. TAYLOR asked Mr. Mawdsley which form of collodion-bromide emulsion plates be considered the best substitute for wet plates in studio work.

Mr. MAWDSLEY thought the moist plates best, and they could be kept ready for use, as they would keep well for three weeks. Dry plates were not so sensitive as the moist. A dry plate was as quick as an ordinary wet plate, whilst the moist plate was three times quicker.

Mr. FOXLEY had tried the plan of converting a negative into a transparency by means of nitric acid, using a bath bromide plate, but failed to get density sufficient.

Mr. NEMERT said he had had a similar experience, but found out the cause and remedy. After using the nitric acid, the film was in such an acid state, even after washing, that it refused to intensify. He found it necessary to dose it with ammonia and water, so as to remove all acidity, and then the alkaline pyro intensified it readily. Over-exposure would also cause thinness.

Mr. MAWDSLEY thought that it was only with iodized plates that the thinness of solarisation from over-exposure occurred.

HENRY WARNERKE said as emulsion plates could be produced as sensitive as wet plates, and give equal delicacy and excellence of result, there could be no reason why they should not be used for portraiture in the studio.

After some further conversation,

Mr. Brooks remarked that he had found that the use of ale or albumen with the pyro aided in securing intensity.

A desultory conversational discussion was continued, in the course of which it was suggested that Mr. Mawdsley should prepare a paper on the best mode of using emulsion plates as a substitute for wet plates in the studio. This at a future period he promised to do.

The proceedings then terminated.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 2nd ult., M. DAVANNE in the chair.

M. J. B. JOHNSON was elected a member of the Society.

A letter was read from Count Kamarowski, requesting, as member, to be supplied with a diploma or certificate to that effect.

The PRESIDENT stated the Society had not hitherto granted diplomas to members, but as many of the latter were strangers he proposed to forward such applications to the Executive Committee, to be dealt with by that body.

A letter from M. Leon Vidal announced the publication of his year-book, the *Agenda Photographique*, for 1877.

M. H. J. NEWTON read a digest of the foreign journals.

M. BRAUX, of Dornach, forwarded to the Society some samples of carbon timus prepared by him, for the inspection of members. M. PENROT DE CHAUMEUX, in the name of M. Noel, exhibited a little furnace, or lamp, to employ with petroleum spirit, for use in ateliers unprovided with gas.

M. ZIMMER submitted to the Society a very fine and numerous collection of views of the East, printed in silver.

M. DAVANNE exhibited two specimens of photo-engraving, the delicacy of which demonstrated the progress which M. Rousselon has recently made in this branch of the art.

M. ANDRA read the report of the Committee of Awards for 1876-78. The decision of the Committee was to the effect that they could not do better than to bear testimony to the remarkable applications of photography made by M. Janssen, by awarding him the grand silver medal of the Society.

The Society having unanimously ratified the conclusion of the Council, the President took upon himself to remit the medal to M. Janssen.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the next meeting of this Society, on Tuesday, March 13th, at the Gallery, 5A, Pall Mall, East, the evening will be devoted to a discussion on "The Silver Bath." The subject will be introduced by Mr. John Spiller, F.C.S.

COPYRIGHT IN PHOTOGRAPHS.—The *Stationer* says, on this subject:—"Our attention has been called so frequently to this subject that a paragraph or two respecting it will, at least, be sure of pleasing many of our readers. Great dissatisfaction prevails among photographers by reason of certain firms advertising, for a very small sum a dozen, to reproduce and furnish good copies of all cartes forwarded to them. The photographer, from his point of view, argues that he has to exert himself to his utmost to press and light his sitter, in many instances to go to the expense of special backgrounds and the most optical appliances, and that after all this he is paid, generally, a few shillings for his 'specimen portrait,' the portrait is sent elsewhere for copies to be printed from it. It seems to us that it will be useless for the photographer to attempt to claim any copyright, but he may and can do this—charge as much for one copy as for a dozen, and so meet the case. Good manipulators will always command a fair price, and the skilled operator has the matter entirely in his own hands. The Act which passed in 1869 declares that 'the person making or executing the same shall not retain the copyright thereof, unless it be expressly reserved to him by agreement in writing, signed at or before the time of such sale or disposition by the vendor or assignee of such painting or drawing, or of such negative of a photograph, or by the person for or on whose behalf the same shall be made or executed; but the copyright shall belong to the vendor or consignee of such painting or drawing, or of such negative of photograph, or to the person for or in whose behalf the same shall have been made or executed.' This really reads that no copyright can be held by the photographer, unless given in writing by the person photographed."

CAUTION TO PROVINCIAL PHOTOGRAPHERS.—We find in a local paper, the *Lynn News*, the report of a case heard before the County Court at Lynn, which suggests a caution to provincial photographers in dealing with travellers. William Hoare, trading as Reeve and Hoare, stationers, of London, sued Edwin Bullock, of Lynn, photographer, for £4 3s. for goods supplied. The circumstances of the case were peculiar, and are these:—The plaintiffs had in their employ a traveller named Ramon, who called on the defendant soliciting orders. The defendant, believing that complainant solicited orders for himself only, gave him an order for goods amounting to something like £6, on the condition that the traveller bought something of him. The traveller bought a hundred views of Sandringham, &c., and the defendant paid him the difference in the account. The plaintiffs, however, subsequently sent an invoice of the ordered goods, and requested payment of the sum of money which had been paid in goods to the traveller. The defendant refused to recognize plaintiffs, but his Honour, while severely censuring the conduct of Ramon, ordered a verdict for the plaintiffs for the full amount, intimating that if the defendant did not own the plaintiffs in the matter, he ought to have sent the goods back at once; he also pointed out to the defendant that he had his remedy against Ramon.

CRACKING IN CARBON TISSUE.—For the benefit of the carbon workers, I will state that I use one ounce of glycerine to twenty of sensitizing solution; and the tissue dries without any danger of its getting hard and crackly, and therefore need not be watched. It will cut up and roll much easier (being more pliable). It is also rendered more sensitive thereby (about one-quarter), but there is no other effect.—*Anthony's Bulletin*.

To Correspondents

COLLODION.—We do not know of any place where you can buy specimen portraits, except such as are published because of the celebrity or interest attached to the person. No portraitist would or should feel at liberty to sell copies of the portraits of his private sitters. Your only plan is to take portraits for such a purpose. Remember also it would not be an honourable course to exhibit, as your own, portraits produced by others.

J. COAN.—We do not know of any lens suitable for the work you require, which we should recommend in preference to that you have. A portrait lens would, of course, be more rapid, but not so suitable to the work. That which you indicate as No. 6 might possibly answer better for groups. But you must remember that there is a limit to the rapidity of lenses under such circumstances, and short exposures must depend on the use of very sensitive plates. 2. Your prints appearing too brown when finished is generally the result of insufficient toning. You tone them a little deeper than you wish to appear when fixed, you say, but possibly will not sufficiently deep. But there is another frequent cause for the prints looking brown, dull, and poor, of which inexperienced photographers rarely take account. The fault is often in the negatives, which have not sufficient force to permit deep printing. Thin negatives, which print rapidly, often give such prints. To secure a rich well-toned print, it is necessary to have a brilliant negative, which permits a sufficiently deep deposit of silver in the blacks of the print before the light portions are overdone. Sometimes the defect arises from the quality of the paper. 3. You cannot have a better work than Mr. Robinson's "Pictorial Effect in Photography"; but we fear it is out of print at present. John Burnett's works on Composition and Light and Shade are excellent also.

TONOMANUS.—You are evidently labouring under the mistaken impression that increasing the strength of your iron developer will give you greater intensity in your negatives. The contrary is the fact. A strong developer will give more harmonious negatives, but with less intensity, than a weak developer. If you reduce your developer to half your usual strength, you will obtain greater contrasts. But the probable cause of your difficulty is the use of an over-acid bath. Boiling the bath generally leaves it more acid, and unless you neutralize the acid, it will have a tendency to give thin images. Neutralize with carbonate of soda, and try.

VALENTIN GUILLON.—The prints enclosed are very good examples of the kind of work. We see no reason to think that working photography in a carriage should be especially unhealthy, if you take care to keep it as well ventilated as possible, and the exercise you have in country roads, travelling with it, will go far to counteract any ill effects arising from the atmosphere of the operating carriage.

PHOTOFILM.—"Putty powder" is the best material with which to polish out scratches from glass, but it is a dangerous task to attempt this upon a lens, for if you alter the figure in removing the scratch, you may easily spoil your lens. Putty powder is made of us.

M. G. TOWNES.—The crystallization you describe in your negative films must probably arise from imperfect washing after fixing. You must remember that for its thorough removal a very thorough washing is required, especially in cold weather. You may use hypo which has fixed a few prints for fixing negatives, but it is possible that in doing this you may increase the intensity of your negatives by a deposit of sulphide of silver. The addition to the solution of a little boiled oil will make it less likely to crackle and scale, or the addition of a little collodion is often useful.

J. C. STANNING.—Thanks. We will obtain the *Builder*.

W. B.—The production of collodion positives has, for many years, been comparatively small, and hence few articles have been devoted to the subject. You will find one in our last YEAR-BOOK on page 72. Dr. Diamond will shortly restate some of his experiences on using the proto-nitrate developer. Here is a formula for its preparation: dissolve in GONNOR of water 319 grains of proto-sulphate of iron, and also dissolve in 6 ounces of water in another vessel 300 grains of nitrate of baryta. Mix the two solutions, and by filtration remove the sulphate of baryta formed by the double decomposition. The clear green liquid is solution of proto-nitrate of iron, and is ready for use in development.

A CONTINENTAL SUBSCRIBER.—We do not know of any copies of Turner, or the other modern English painters you name, published in carte size. We fear that we have no facilities, even if we could undertake the task, to enable us to indicate which of the landscape photographs of the English photographers of repute best illustrate the art principles indicated in Mr. Robinson's work. Mr. Lake Price's articles on Composition, &c., appeared in our third volume. We believe that lantern slides of Pinnel's Cave, Olant's Conway, &c., are published, but do not remember by whom. Write to Mr. F. York, of 87, Lancaster Road, Notting Hill, London, for his catalogue of slides. You may probably find them there. Some years ago there were published in Berlin a large series of card and other small sized photographs, containing copies of the great masters. The publishers were, if we remember rightly, Schaner and Co.

CARMINIST.—We have seen the *Notes and Queries* you mention. They are intended for private circulation, amongst themselves only.

CARBON PRINTING.—The conclusion of Mr. A. Walsley Turner's series of articles on this subject is in type, but stands over until our next through press of matter.

Several Correspondents in our next.

The Photographic News, March 16, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

FORGERIES OF BLUE AND RED BANK-NOTES—A PHOTOGRAPHIC PLOT.

Forgeries of Blue and Red Bank-notes.—Among the difficult problems which photographers have of late succeeded in solving may be cited two, which have for years past been deemed out of their power to accomplish. We allude to the counterfeiting of the blue bank-notes of France and the red ones of Scotland. A gentleman connected with a large Glasgow firm recently informed us that he had seen, pinned to a genuine Scotch note, an imitation which would have been passed unquestioned by all but professional tellers. Again, the news reaches us from Germany that the cobalt blue notes of the Bank of France are likewise imitated with considerable success—or, at any rate, reproduced in such a way that most people would be mistaken. Blue, and cobalt blue especially, as we all know, gives a very faint mark upon a negative, while red, on the other hand, especially if tinted with a little orange, produces the same effect almost as brown or black. Yet, by some means or another, methods have been devised for reproducing, by means of the camera, sufficient indication of these colours to prepare a printing block from which notes can be struck sufficiently like the original to pass muster. This, then, is the result of all the exertions which paper makers and printers have made to produce documents which cannot be photographed. In the case of the Bank of France a very expert and accomplished photographer (M. Gobert) has been for a long time attached to that establishment, and has afforded valuable services in connection with the detection of forgeries; while in this country there is scarcely a bank of importance which has not paid considerable attention to the matter of securing their papers from being tampered with by the camera. Twenty years ago the commercial world was particularly alive to the matter, and the colours employed to-day upon the various cheques were only adopted after very serious deliberation. Any colour, it was considered, would baffle the photographer, and the employment either of very actinic pigments or the reverse was but an additional safeguard. Now it would appear as if colour is rather an aid than a difficulty in the way of counterfeiting cheques and notes, for the pigment covers a multitude of minor errors which may exist, and by its presence at once suggests to the eye the genuineness of the document. It stamps the paper with a certain individuality, and if this is adequately represented in the forgery, few persons will look into details. In the case of the Bank of England notes and the Prussian notes, which are simply black and white, forgeries are by no means rife, although, in the case of the latter, the microscopic type, informing the world that those who are found guilty of forgery will be subject to penal servitude, has ceased to be the protection it was formerly, for microscopic type is of all things easy to produce by the aid of the camera. How the red and the blue can be successfully photographed is a subject we need scarcely enter into here, but that a clever operator could accomplish it there is little doubt. An Austrian gentleman (M. Max Jaffé), who has investigated the subject very fully, and has published an interesting report upon his conclusions, which we shall print at length in our next, points out several methods which a forger might adopt, although he does not deny that he would have in any case a difficult and tedious task before him. Thus a negative taken in the first instance of a cobalt blue note might show but little difference between the rendering of the white ground and the colour, but this difference may be exaggerated afterwards to any extent, M. Jaffé points out, by reproducing it by the aid of the dusting-on process, or by simply producing successive transparencies in the camera which are underexposed and well intensified. His suggestion is to employ

layers of colour printed one over another upon cheques which he believes will be more effectual than anything else in preventing any competition between the banks and the outside public in this branch of industry. Since the detection of the Scotch forgers in Glasgow some ten years ago, who employed photography very skilfully in their trade, there has been no particular case under the notice of our criminal courts. In that case, it may be remembered, the principal agent concerned (a man named Greatorox) was cleverly trapped in America, whither he had retired from active life. That he was in one of the great cities of the western republic was a fact pretty generally known, but to pick him out of the crowds of emigrants arriving from all parts was a task that gave little hope of success. A simple scheme, however, soon brought the fish to the net. An advertisement was put into the papers for a photographer and lithographer possessing certain qualifications which the forger was well known to have; and within the space of a few days the man who was "wanted" turned up in his own person to take the appointment that was waiting for him. The appointment, as he afterwards found out, was in England, and he held it, we believe, many years. However, photography is by no means the natural enemy to bankers that some people would make it out, for it has caused many an absconding clerk and defaulting cashier to be brought to justice. The reference we made, too, to the Bank of France shows that photography is regarded, by that establishment, at any rate, with confidence. Instances are not unfrequent of the detection of forgeries by means of the camera, for the sensitive plate sees matters in a different light to ourselves. An erasure, unapparent to the casual observer, is soon detected by the cliché, which prints a spot or stain where the surface of the paper has been abraded, and where it has ceased to reflect the light in the same uniform manner as the surrounding portions. Again, an ink mark which has been written over, or figures apparently obliterated, are often seen distinctly upon a photograph, and at the Bank of France it is, indeed, an admitted fact that the camera is one of the best and cleverest detectors of forgeries.

A Photographic Plot.—We do not remember to have seen photography figure as the turning point of a novel, although the art has occasionally been dragged into play and farce. But in the *Moniteur de la Photographie* there is an extract from an amusing story in which photography plays a most important part, and has much to do with the unfortunate denouement. A young gentleman, who is an amateur photographer, receives an invitation to the house of a gentleman whose acquaintance he is particularly desirous of cultivating, by reason of the existence of a charming Mademoiselle Clémence. The young fellow's doings as a photographer have reached the ears of father and daughter, and they both pray him to bring his apparatus and camera when he favours them with a visit at their chateau. M. Adrien, the young photographer, arrives, and is not long in ingratiating himself with the young lady. Time goes on, when at last, late in the afternoon, the question of taking a picture comes into the mind of the old gentleman. Adrien must bring out his camera at once, and begin forthwith. He is to take a group—one that is to be a reminiscence of their country life. A magnificent prize is to be included in the picture, to be posed in the vicinity of the proprietor, and Mademoiselle Clémence runs off to get a favourite rabbit. Adrien rather objects to the rabbit, but he is told, as his brethren have many a time before him, that it is the quietest and most obedient of animals, and the charming girl will hold it in her arms to prevent its moving. The young amateur poses the group with the eye of an artist, and, in the midst of a good deal of bustle and much impatience on the part of the other guests, Adrien takes his photograph. The result is, as might be expected, the ox and the rabbit all over the plate, the first obscuring the father, and the other the daughter. A good

deal of laughter over the picture ensues, only Clémence and her papa do not join in the merriment. They do not care to be made the subject of practical joking, and look glum enough upon M. Adrien and his apparatus. The latter is glad enough to withdraw quietly, but in his nervousness manages to upset both iron developer and silver bath—the first upon an inlaid floor, and the other upon the train of a gorgeous widow. The curtain falls upon the young man's ignominious flight, and the destruction of his cherished hopes.

FRENCH CORRESPONDENCE.

ALCOHOL IN CARBON PRINTING; ITS EMPLOYMENT IN THE SENSITIZING BATH—EXTENSION OF PHOTO-MECHANICAL PRINTING IN PARIS—WOODBURYTYPE AT THE "MONITEUR UNIVERSEL" OFFICE—THE "AGENDA PHOTOGRAPHIQUE"—DAVANNE'S "ANNUAIRE"—IMPROVED SULPHATE OF COPPER DEVELOPER.

No doubt your readers remember that some months back M. Leon Vidal published a note in reference to carbon printing, in which he pointed out that a sheet of tissue might be exposed under a negative for a much less period if, after printing, it is put into alcohol and allowed to dry before development. M. Boivin has taken this communication as the starting point of a series of experiments, and has recognised many advantages in the employment of alcohol in connection with manipulations in the carbon process. He has been led to compose a new sensitizing bath, which he thinks will render very great services, for it permits him to obtain, he says, results much superior to those secured by the sensitizing solutions now in use. He prepares it in the manner following:—

Spring water	...	...	70 cub. cents.
Ordinary alcohol	...	...	30 "
Bichromate of ammonia	...	...	3 grammes
Ammonia	...	...	1 to 3 drops

The bath is tested for slight acidity by means of litmus paper. As rainwater contains organic matter of a kind to reduce the salts of chromium, and thus to destroy the solubility of the mixture, it is preferable to employ spring water in making up the bath. The salts which spring water contains do not alter in any way the solubility of the bichromated gelatine; or, at the most, they have a tendency to lower the strength of the bath. An immersion of from one to two minutes of the tissue is quite sufficient for sensitizing it. It moistens, and all greasiness disappears without undergoing any contraction, as in the case of baths without alcohol, especially if the immersion is too prolonged. The sole inconvenience of the bath is that it is a little more costly, although an ounce or two of alcohol does not, after all, represent a very great outlay, even at the price charged for it in France. When the tissue comes out of the bath, it is placed, film downwards, upon a well-cleaned glass plate, and the squeegee is passed over it to remove the excess of liquid. The sheet is then detached from the glass, and is suspended to dry. It is necessary to be very careful to employ in this operation a special squeegee, for if touched with any alum the film becomes insoluble. Emanations from a laboratory, such as gas, benzole, &c., are also injurious. Bichromate of ammonia imparts much less sensitiveness than bichromate of potash, but the liquid retains its virtue longer. With alcohol, the activity of the first of these salts becomes much greater than that of bichromate of potash mixed with water. In conclusion, M. Boivin thus resumes the advantages gained by the addition of alcohol to the sensitizing bath: the drying of the tissue is much more rapid; it is effected in a few hours, instead of requiring a whole day; in the printing, about one-third of the time is gained, and the image is more vigorous. The solubility of the tissue remains the same for a much longer time, especially if the tissue, in a well-dried condition, is put

between two glasses somewhere sheltered from light and moisture. For this reason, it is well to put the sensitized tissue into boxes, hermetically sealed, which contain chloride of calcium. Finally, the action of alcohol prevents the tissue from contracting, as in the case with an ordinary bath. The constriction takes place in the interior of the tissue itself, and produces a slight degree of coagulation, which does not, however, affect the solubility of the gelatine in warm water when proceeding to development.

An important addition is being made to the photo-chromic workshops and greasy-ink printing works at the office of the *Moniteur Universel*. It is the fitting up of a workroom for photoglyptique or Woodbury printing. There are twelve presses of large dimensions, which furnish double pictures in the same fashion as is done at the establishment of MM. Goupil at Asnières. As a matter of course, the hydraulic press necessary for the production of the clichés—or, rather, printing blocks—is of considerable power. Already M. Leon Vidal has made several experiments, of a novel and ingenious character, towards applying the new process. We believe, in fact, that he will shortly show the results of his work, so useful from an industrial point of view, which will be as interesting as they are unexpected. Something is said, too, of the development in France, very shortly, of the process of printing by platinum introduced by Mr. Willis, and which has been acquired by MM. Wittman et Poulenc. Many photographers who have witnessed the manipulations connected with the new process say great things of it.

The *Agenda Photographique* for 1877—M. Leon Vidal's Annual—appeared this week. It contains several very successful prints in greasy ink and photochromie.

M. Davanne, on his part, has just published, not a continuation of his *Annuaire*, which he has abandoned since the war, but a veritable practical Manual of Photography, in which is to be found all the new methods which represent recent progress in our art. This volume, which is in a very condensed form, and gives details in a terse and precise manner, represents the present condition of photography from a practical point of view, and embraces all the improvements produced within the last few years.

I have just received from one of our principal experimenters a very exhaustive note upon the employment of a developer which is not absolutely new, but which seems to have been forgotten. The formula for its preparation is as under:—

Water	...	...	125 cub. centimetres
Sulphate of iron	...	...	6 grammes
Sulphate of copper	...	...	2-50 "
Acetic acid	...	...	8 cub. centimetres
Alcohol	...	...	5 "
Ammonia	...	...	A few drops.

When this solution, after standing, is filtered, it may be preserved for several days, but it is, nevertheless, well to employ it before it is very old. To develop the image, there is poured into a glass the necessary quantity of liquid, and a few drops of a saturated solution of acetate of lead in distilled water is then added, to which a little nitric acid has been put. I have in my hands several portraits taken with an exposure of ten seconds in an apartment lighted by a single window, and which owe to this method of development excellent modelling and great vigour. Probably the readers of the PHOTOGRAPHIC NEWS may be interested enough to undertake some experiments with this particular developer.

ERNEST LACAN.

OUT-DOOR MEETINGS.

BY JAMES CRIGHTON.*

MR. CHAIRMAN AND GENTLEMEN.—It is with some diffidence that I appear before you with a "paper," seeing that I am, comparatively speaking, but a young member

* Read before the Edinburgh Photographic Society.

of this Society, and also that my knowledge of photography is of such a very limited nature, having attained to little more than in being able to prepare a decent plate, and develop out of it a fairish negative; and, believe me, I am not a bit conceited in having got so far, for the longer I prosecute the, to me, pleasurable pastime, the more I find I have to learn; and the oftener I mix with the working members of our Society, the further I get advanced in the art. This is the principal reason I have for doing my little to advocate out-door meetings, for at them many useful hints are got, and much experience gained. And another reason I have for bringing these meetings before your notice is the fact that there are many who have joined the Society within a few months do not know of the existence of such an auxiliary; and there are also those who have been connected with it for years who seem either not to know, or have forgotten, that these meetings have been an institution for long. It is by way of information to the former, of remembrance to the latter, and for the purpose of having them more largely taken advantage of, that I endeavour to bring their claims before you.

Our out-door meetings were, I understand, instituted some years ago for the purpose of making up for, in some measure, the recess of our ordinary meetings during the summer months, it being often found that an accumulation of business waiting for the resumption of the usual meetings was the result; but by the institution of outdoor meetings any pressing business could be disposed of. Now this, I believe, was one of the objects to be gained; but never, in all my experience, has it been the principal one. I have never sat in council at any that I have attended. I have seen lots of cameras employed, and heard a deal of conversation about the Society, and the weal thereof, but little more in the way of business. These meetings are composed of members who, for the occasion, are willing to leave the conducting of their business to other heads and hands, and enjoy a day in the country.

A day having been fixed on, and the spot to be visited selected, a general preparation takes place. Those who have not a stock of plates on hand, get this state of matters rectified. Others get their traps collected together—everything carefully gone over to see that all the apparatus is in its place, and all working smoothly, for it's a bad job if you omit to put your lens in your pocket, or forget your tripod head, or find that that fractious shutter is going to bother you again, and you are far removed from where a sprinkling of black-lead or other suitable substance can be got to sweeten its ups and downs. This brings to my recollection what frequently happened to a friend of mine, who eschewed collar studs, on a Sunday morning (when a long lie was excusable); it was no unfrequent thing to hear him exclaim, when his collar button and collar button-holes did not work sweetly, "It all depends on a button whether or not I am to get to church this morning." Just so it is with photography in the field: on that fractious shutter, or the forgetting of that very particular screw, will depend whether or not I am to get some of those charming views, or, at all events, get them in comfort. I speak from experience as to the preparation I used to have in my early days, but I am happy to say that as to forgetting any requisite, I speak only from surmise. The plan which I have adopted for some time, and the motto which suits it, is "Ready, aye ready." I have everything at all times ready, that is to say, my slides are always full, camera, &c., packed up, everything just to lift and go, and this plan I would recommend to all who are in the habit of leaving everything to the last, for it is strange if, in the hurry of the moment, something is not forgotten.

Well, then, after a pleasant drive, run, or sail, we arrive at the scene of our operations, or, at least, the locality in which our work is to lie. Here we may have the rushing torrent, or peaceful, flowing stream or river, the hill and dale, the stately trees, or venerable ruins,

which, while furnishing us with subjects for camera, give us also subjects for contemplation, and lead our minds "far back to other years."

If the immediate locality abounds in subjects, a tour of inspection takes place, and the time fixed when this and the other view will be suitably illuminated; if, on the other hand, they are so situated as that the mode of procedure is rendered impracticable, then things are just to be taken as we find them, and the best selection possible made. Cameras are then unpacked, set up, and focussed, light and watch (about the best of all actinometers) consulted, and, under favourable circumstances, in from three to five minutes we expect to have a fine picture.

Now during our journey hither the conversation has been almost entirely on photography; it has brought us out, and it is the topic and object of the day. Are we bowling along some beautiful highway? We see a picture in that quaint gateway, from which there recedes an avenue of noble trees; in that lovely, rose clad cottage, with its latticed windows and rustic porch. Is our home, for the time, on the deep? Then the rolling billows, as they break on some rock-bound coast, arrest our eye. Or are we careering through a beautiful tract of country, getting only a momentary glance of the beauties we pass? Yet, almost instinctively, we see down in that glen with its streamlet and wooded banks, in that silvery lake with the bold and rugged mountain side mirrored on its bosom, something worthy of our admiration. So identified does everything appear to be with our pursuits, that we find pictures in trees, beauties in running brooks, subjects in stones, and photography in everything. And then the experiences of one another are freely given, and this and the other method of working is recommended, new processes are sifted, anything striking in apparatus is overhauled, and a chorus of voices extol its merits: "It's a capital idea!" says one. "The description given leads me to think that it will be a felt want supplied," says another. But one canny Scot thinks that "it looks all very well in print, but the proof of the puddin' is the presein' o't." Photographic literature generally is considered, and this and the other doctrine therein taught. Thus the conversation proceeds, and thereby much valuable information is got. And during our picture seeking, how our minds and tastes get elevated (bear in mind I am speaking as a young aspirant in the art)! With lynx eyes we watch the every motion of the veterans who, as a rule, figure among us; we see how carefully they study the composition of a picture, and how fastidious in their choice of subjects; whatever advice they give is the correct thing; in short, they are our model, we pin our faith in photography on them; so, ye veterans, beware! ye are the hope of the rising generation.

I come now to a few suggestions I have to offer in regard to our out-door meetings. I would suggest that these should be more frequent than hitherto. We should aim at having, at least, six during the season—one every month, beginning in April; that a day be fixed on which the same should be held; that the work done during the season be submitted to a suitable party outside the Society, who would adjudicate thereon; that a prize of some sort be given to those which, in his opinion, possess the most merit, but that no one be permitted to compete who has not attended at least three of the meetings, and who has not six pictures to show; and that all those who purpose attending should send their names to the Secretary, who would intimate to such the time and place as they occur. I think it highly desirable that we should begin early. It becomes a very slow process when these meetings are delayed so long, and held when the light gets so poor, and the weather so unsettled—when it requires nearly, and in some cases a whole, hour's exposure to be of any use. It is also, I think, very desirable that some such award as I have indicated should be given, for thereby an impetus would be given in the way of a little friendly rivalry, which would induce a

better attendance, and help to ensure some good work being done. It is equally desirable that a definite time be fixed, which would enable us the better to make our arrangements to attend.

I have thus endeavoured to bring before you something absent our out-door meetings, and my aim throughout has been to show the advantages that may be derived from them in thus associating with the members of this Society who attend. As to advantages, we have had line upon line in the charming work—charming alike for picturesque effect and manipulative skill, which it was a high privilege to view in our late exhibition—work which the eye never tired of beholding, but which unfolded fresh beauties by continued inspection—notably so in that frame of "Picturesque England and Ireland"—and which should give such an impetus to us all, that some good work will be the result in this and succeeding years.

CARBON PRINTING.

BY A. WELLESLEY TURNER.*

In order to simplify my description of the development of the latent image, which we must now suppose is impressed on the tissue, and at the same time to make it as practically comprehensible as possible to my readers, I must say a few passing words on the developing sink in which this operation is performed. I wish it to be understood that I do not give it so much as a model for others to copy, but rather to facilitate my description of that branch of the operation for which it is used. I merely state what I have found most useful in my own circumstances; others must suit themselves as most convenient, remembering that it is more important, first, to properly understand all the operations necessary for the production of a certain result, and then make for themselves such appliances as most expedient, than to go by any fixed system of fixing up the operating room.

I develop my prints in the same room as I wax and collodionize my plates, the opposite side of the room being occupied by the developing sink, which is merely a large wooden tank, lined with lead, about seven or eight feet long by three feet across, and six inches or so deep. At one corner of this is a waste pipe, and over it a second bottom, made of pieces of wood, running the whole length of the sink, each piece about six inches wide, with space of an inch between them; this is raised a little from the bottom of the sink, and forms a clean flat place to work on, as well as allowing a free use of water, without fear of slopping. At the left end of the sink is the before mentioned dish for washing the collodionized plates, and at the other end a similar dish for use in the development. Next to the latter is a flat zinc tray 22 by 26, and further on a flat board for squeegeeing on; at the back of the sink a stand for holding the plates when washing after development, and at each end a tap for supply of cold water, with two or three feet of flexible tubing attached. My supply of warm water is obtained from one of Maughan's patent geysers, conveniently fixed to the wall near the developing tray. This is a capital apparatus for obtaining a supply of warm water, and gives quite sufficient to supply any ordinary business for this purpose. With this slight outline of what we are to work with, we will now commence the operation of

Development.—Previous to commencing this, arrange your prints in quantities sufficient to fill each plate; partly fill the flat zinc tray with cold water, and taking one of the washed collodionized plates, lay it on the squeegeeing board; place as many of the prints as are required to fill one plate in the cold water, draw them briskly through two or three times to free from air-bubbles, and gently pass a soft sponge over the surface to clear off any adhe-

ring particles of dust or dirt; leave them here till they have absorbed sufficient water, which they will have done when they become very limp, and are flat in the water without curling up in either direction; do not hurry this part, but, on the other hand, it is very important not to leave them in too long, so if this should be done they will refuse to adhere properly to the plates without a great deal of squeegeeing, and require to be left long under pressure. There is a right time for doing this as well as all other things, and when this arrives, take the prints out one by one, and place in position on the wet collodionized plate in a manner similar to mounting silver prints; this should be done rapidly, so that they may, as near as possible, be equally soaked; a piece of india-rubber cloth is now thrown over them, and they are well squeegeed. The prints are all treated in this manner, and placed in the space kept for the purpose on the bench, one upon the other with a sheet of stout blotting-paper between each; upon the whole a sheet of plate glass is put, and they are left under pressure for about twenty minutes. Beginners, I am afraid, are rather inclined to shorten this period in their haste to see their work. The operator need not be idle whilst they are under pressure, for he will find a variety of things to do in the interval. I only use one flat dish for developing my small prints, the one before mentioned; while waiting, this can be emptied of the first water used in washing, and filled again with warm water; the vertical dish can also be filled, as well as many other useful and necessary preparations for the next step in the operations. If they are taken from under pressure too soon, it will be found that they do not adhere as well to the plates during development as they should, and consequently will not bear much rough usage, and are even liable to come up at the corners, although this seldom happens in developing upon collodion unless the tissue is defective, or they have been left a very short time indeed under pressure. When left the full time you will find that the action of suction which secures the image to the plate has done its work perfectly, and it is then much safer to work them; it is perfectly remarkable in some cases how firm the adhesion secured by this means is; twenty minutes, as stated before, is sufficient time, however, to secure this effect, but they may be safely left a much longer period. On several occasions, when pressed for time in the evening, and being unable to develop that night, I have left them under pressure till the next morning, taking the precaution, however, to leave wet blotting-paper between each plate in contact with the back of the tissue to keep it damp, and then have finished them the next morning, without the slightest deterioration in any respect; so long as the tissue is kept moist there is no fear, although, if dry, of course the printing would have continued by the long keeping, much to its detriment. This fact may be useful in cases when it is necessary to print till the last thing, or other business calls you away.

(To be continued.)

CARBON PHOTOGRAPHY.

BY AD. BRAUN AND CO.

[M. BRAUN was one of Mr. Swan's earliest licensees, and has, during many years of extensive practice, acquired a large and valuable experience in working carbon.—Ed.]

We offer to the photographic public a simple and practical description of the different operations constituting the carbon process, as used in our ateliers, after thirteen years experience. This treatise, which we have endeavoured to make very explicit, will contribute, we hope, to the spread and adoption of a process which offers to photographers so many important advantages.

The inalterability, the artistic aspect of carbon photography, the simplicity of its manipulations (outside of the manufacture of the prepared paper), will cause this beautiful process to be used in all photographic establishments in the

near future. We use daily in our establishments about twenty-five rolls of 4 metres by 85 centimetres (157 inches by 33½ inches). We are prepared to deliver to the trade as many as one thousand rolls per day. This proves that we have surmounted many difficulties to make this process very practical.

It is the result of all these efforts and of a long experience that we offer, and we do it with a confidence given to us by the favour which the public accords to the products of our house.

INTRODUCTION.

The carbon process has for basis the property possessed by gelatine mixed with a salt of chrome (such as the bichromate of potash) of becoming insoluble when acted on by light. If, therefore, colouring matters are incorporated with this gelatine, they will be retained, after exposure to the light, by the portions of the gelatine which have become insoluble, or will leave their support together with the parts that have remained soluble, accordingly as they have been differently impressed by the light. The gelatine mixed with colouring matter is spread upon a paper support; in this state it is not sensitive to light, and can be preserved for an indefinite length of time. To make it sensitive, it suffices to impregnate it with a solution of bichromate of potash.

In the sensitized state the paper thus prepared cannot be kept so long; it is necessary, therefore, to only prepare the quantity we wish to use. The image given by the exposure is hardly visible. It is developed by washing the soluble portions in warm water, after having placed it on a new support.

To better describe this operation, we will trace an enlarged section of this pigmented paper after exposure. The gelatine which has been made insoluble is at A A; it is the image; B B is the coating that has remained soluble. If, therefore, we were to immediately wash the paper in warm water, the gelatine which has remained soluble would in



Fig. 3.

dissolving carry away with it the image. It is, therefore, necessary that this image, which comprises the insoluble portions, should be placed on a support before proceeding to the washing. The pellicle attaches itself to this new support, and abandons in the washing the soluble gelatine and the primitive paper. The image is developed. This image by this first transfer is naturally reversed. It is necessary, if a reverse negative has not been used, to make a second and final transfer.

The brilliant appearance of the print depends on the surface of the support which has served for the washing. This support must be chosen in accordance with our desire to obtain a print more or less brilliant, or even mat. All these different transfer papers are prepared and furnished by our house. The consist of:—1st. Papers for direct transfer (prints obtained with reversed negatives). 2nd. Temporary paper supports (caoutchouc and waxed papers) for direct negatives, the prints of which are to be transferred to (3rd) final papers.

After this rapid summary of the general principles of carbon printing, we will successively examine the different operations of the process that we follow in our establishment, and which consist of:—1st. Sensitizing and drying. 2nd. Exposure to light. 3rd. Transfer, direct and temporary. 4th. Washing. 5th. Final transfer from the temporary support. 6th. Varnishing.

1. *Sensitizing and drying.*—Immerse the sheet of prepared paper in a filtered bath of a solution of bichromate of potash contained in a porcelain dish. Allow it to remain until the pigmented surface is softened, withdraw it, and

place it, the gelatine, underneath, upon a glass plate slightly inclined on the dish (fig. 2).



Fig. 2.

Pass a caoutchouc squeegee over the back of the gelatinized sheet, so as to remove the excess of bichromate solution, which will flow into the dish; then remove the sheet, and suspend it, by wooden clamps, upon a thin cord stretched for the purpose. In very dry weather it becomes necessary to place at the lower extremity of the sheet a strip of light wood, so as to prevent the curling of the sheet, which in drying would break. The proportions of the bichromate bath may vary according to the degree of sensitiveness which it is desirable to give to the paper. A weak bath gives a less sensitive paper, but the prints of which give more depth. A strong bath, on the contrary, produces greater sensitiveness, but less vigour. These effects are produced within an average of from four to five per cent. of bichromate.

The sensitizer should have an alkaline tendency, acid in the bath being always injurious. The bath should, therefore, be composed as follows:—

Water	...	...	...	1 litre, 1 quart
Bichromate	...	...	...	50 grammes, 13 drs.
Ammonia of commerce	...	...	...	10 154 grs

Up to the present time the paper is not sensitive even after its immersion in the bichromate bath. This operation may, therefore, be done in daylight. A necessary precaution is to perform this operation in a cool place, especially in summer, in order to avoid the too great softening of the gelatine coating. The temperature of the room should not exceed 15° Centigrade (59° Fahr.).

The manner of drying exercises also an influence on the sensibility of the paper, and should be done regularly, and, as far as possible, in six or eight hours, in a dry place, well ventilated, at an average temperature of from 10° to 20° Centigrade (50° to 68° Fahr.) at most, and in complete obscurity.

2. *Exposure to Light.*—The time of exposure appears at first to offer great difficulties to the operator, for the appearance of the prints can only be judged after the washing; notwithstanding that, a little practice and the aid of our photometer will soon enable one to work with absolute certainty. The paper should be dry enough to be slightly brittle.

Printing may be done in the sun or in the shade, observing, however, that, contrary to what takes place with albumenized paper, carbon prints made in the sun are more vigorous than those that have been exposed in the shade.

To judge of the time of exposure, it is necessary to observe the strength of the cliché, the condition of the light, the sensitiveness of the paper. To obtain the greatest amount of vigour, the paper should be sensitized in a weak bath, and printed in the sun.

In the contrary case, a stronger bath should be used, and the printing done in the shade. It is absolutely necessary that clichés used in carbon printing should be surrounded by opaque borders.

PRINTING PHOTOGRAPHS ON GLASS.—M. Siegwart, in the *Polytechnisches Journal*, directs the operator first of all to secure an image by means of gum, honey, &c., and bichromate of potash, and to dust this hygroscopic picture with red lead powder. The red lead image is then burnt in; and the more soluble lead glass thus obtained is treated with concentrated nitric acid whereby a dull, white image is produced which may be viewed as a transparency.

The Photographic News.

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THE DISCUSSION ON THE SILVER BATH.

It is probably unfair, and obviously unwise, to expect any very especially new information to be elicited during an organized discussion of such an old subject as the silver bath, its defects and remedies. The silver bath, with its varying conditions, forms such an important feature in the everyday life of a photographer, and the means of inter-communication between photographers are so facile, that every novelty, every incident, and every suggestion in connection with the bath has probably been made and fully discussed long ago. And still, as many photographers will be ready to exclaim, there are many puzzling, some almost mysterious, aspects of the question which have not yet been solved, and which were not solved on Tuesday night. The one point prominently brought under the attention of photographers, with which they were not thoroughly familiar before, was the frequency of sulphate of silver as a cause of pinholes. As Mr. Spiller pointed out, the source of this contamination is not difficult to suggest. In every sample of iodide of potassium he examined he found sulphate of potash as an impurity. Traces of sulphuric acid often remain in contact with pyroxyline. Much of the nitrate of silver used by photographers has been recovered from their residues, and most invariably contain traces of some sulphur compound. And, as we may add, it not unfrequently happens that commercial samples of nitrate of silver contain traces of sulphate, sulphuric acid having been used in separating the silver. The addition of a barium salt to the bath so contaminated at once proves a remedy, and eliminates the sulphuric acid as sulphate of baryta. It may be desirable here to mention, for the benefit of our younger readers, the fact that a powerful affinity exists between sulphuric acid and barium, so that where that acid exists, either free or in combination, it may as a rule be detected and isolated by means of a barium salt, which is thrown down as an insoluble white salt, sulphate of baryta.

The action of sulphate of silver as a cause of pinholes, and of the addition to the bath of nitrate of barium as a remedy, are not new facts, as Mr. Spiller observed, referring to us personally as his authority. In our issue for February 23rd, 1866, an article by Dr. Vogel appeared, entitled "On a New Cause of Pinholes and Streaks, and on the Action of Nitrate of Baryta in the Negative Bath." In this article the whole subject is fully treated, the origin of the sulphate of silver being traced, and the action of the barium salt as a remedy described; its tendency to give increased intensity being especially noted. It is to be regretted that the details of exhaustive experiments of this kind are so often overlooked or forgotten. Scarcely

any one seems to remember Dr. Vogel's discovery. Two or three years ago a member of the South London Society proposed the addition of nitrate of baryta to the bath as an empirical remedy for pinholes, without propounding any theory of its operation; and it has, during the last few years, acquired some vogue as a remedy, whilst few who have benefited by its use have ever associated Dr. Vogel's name with the benefit. The frequency with which it has proved efficacious shows how common the defects arising out of the presence of sulphate of silver in the silver solution have been.

Another remedy for a disordered bath, essentially of an empirical character, is cyanide of potassium, regarding the value of which there was much testimony forthcoming on Tuesday evening. As Mr. Payne, of Aylesbury, pointed out, he wrote to us many years ago mentioning the accidental addition of cyanide to his bath, which, however, turned out to be beneficial. So far as we remember, the first person to propose the use of cyanide as a valuable remedy for a disordered bath was Mr. J. S. Tulley, then, we believe, of Sheffield, and now of London. This is something like fifteen years ago. He added a teaspoonful of his cyanide fixing bath to a negative bath, which looked like pea-soup, and, *presto!* he had secured a silver solution giving better results than when it was new. Mr. Blanchard was able to confirm the claims of cyanide as a remedy. Mr. H. J. Burton, a photographer of unusual skill and experience, used cyanide to the original bath as conferring special qualities of excellence.

In some former experiments, Herr Warnerke had discovered fulminating silver in the precipitates, causing pinholes, but his experience had not been repeated by others. No light was thrown on many abnormal cases which have been recorded—such as the sudden appearance of a crop of pinholes, and their sudden and unexplained disappearance. The discussion will, however, be renewed at the next meeting of the Society, to be held on the evening of Easter Tuesday, and it is probable that the subject may then receive a more exhaustive treatment.

MR. SWAN'S DISCOVERIES IN THE CARBON PROCESS.

THE time is past in this country when it is necessary to maintain Mr. Swan's claims in connection with the carbon process. In the United States it seems, however, that Mr. Swan's patent stands in the way of introducing free trade in his process, and it becomes worth while to endeavour to undermine his claims. M. Adolphe Ott, as agent of M. Braun and Co., is endeavouring to introduce carbon printing, and supply the materials for the work; and to clear his ground, Mr. Swan's, and doubtless subsequent patents, must be proved invalid. We should scarcely think it necessary to repeat a defence of Mr. Swan's claims, which we have, on former occasions, showed to be sound and valid, but for one circumstance: M. Ott refers to us as evidence against Mr. Swan. This we feel bound to correct. He refers to our work on Pigment Printing, to establish a position precisely opposite to that which is in the work itself set down. In the passage referred to we had just been describing the details of Mr. Swan's process, and the history of its discovery and publication, and we proceed to remark that in the discussion which followed its publication, it transpired that Mr. Davies, of Edinburgh, had made transferred carbon prints in the course of some experiments as early as 1862, but the publication of this fact did not occur until after the patenting and publication of Mr. Swan's discoveries. As M. Ott and others must know well, the point upon which opposition to a patent must rest is prior publication: the question of prior discovery does not, therefore, come under discussion. Mr. Swan has never told the public when he made his discoveries. Their date, so far as the public is concerned, is that of their

publication. But we may mention that nearly twelve months before the date of publication we were aware, from personal information, that his discoveries had been made; how long before that we cannot state.

SUBSTITUTES FOR GLASS IN DRY PLATES.

IN Mr. Ellerbeck's interesting paper before a recent meeting of the Liverpool Society, he refers to certain difficulties he found in the use of paper as a basis for the collodion film. We are indebted to Col. Stuart Wortley for the suggestion that this was doubtless due to the omission of the *couche* of india-rubber, which should be placed between the paper and the gelatine. As this is a direction in which it is probable dry photography will tend, we think it will be interesting to reproduce here Col. Wortley's instructions published in our last YEAR-BOOK for producing negative tissue, as they are brief and practical, and have been found successful:—

"During the past summer I have obtained some very good negatives by the following method. Paper is coated with a solution of india-rubber in chloroform, and, when dry, with a twenty-grain solution of Nelson's opaque gelatine. When the latter is dry, the paper is ironed perfectly flat, and the edges turned up to form a tray. It is then coated with washed emulsion and dried.

"After exposure it is developed, either by use of a dish with false bottom, as suggested by Mr. Warnerke, or by the simpler method of forming it into a tray by turning up the edges.

"After development, the negative (having been thoroughly washed) is laid, collodion side downwards, on a piece of papier minéral, coated with gelatine rendered insoluble with chrome alum, and gently squeezed in contact with it. It is then floated, back downwards, on warm water, to loosen the negative from the first paper by dissolving the gelatine; and you then have a collodion film attached to the papier minéral, and ready for printing.

"This way of working gave me two advantages. I was able to use a thick paper, in some experiments even cardboard, as the original support of the film, while the finished negative was on papier minéral, ready for printing, and in the best state for any necessary retouching. I may mention that if preferred, the negative may be allowed to dry, and be transferred at any time subsequently to its development, and that if it is desired to reverse the negative, it can be floated off the original support, and then taken on to the papier minéral, so as to have either side that may be desired next to that paper.

"The above process was published by me in the journals more than two years ago, and I have found its great value since in the reduction of my impediments in travelling."

THE CARBON CONTROVERSY IN AMERICA.

OUR readers are aware that the carbon crusade against silver printing in America has produced a large amount of excitement in the United States. M. Lambert, as the *Cœur de Lion* of the crusade, has been very successful, and secured many staunch followers. But there are, on the other hand, some very virulent opponents. Our Philadelphia contemporary and M. Lambert have in some way come into antagonism, and the journal of the former has become the fortress of the unbelievers. Mr. E. Z. Webster, one of the fathers of photography in the States, makes a serious onslaught on carbon. He says very plainly to the carbon workers, "We Argentumites intend to foil your efforts to poison the minds of the public, and 'bulldoze' us into giving up the advantage which we have, for an untried, unproved, unprofitable, and, as yet, unpopular process." He boldly claims all the advantages for silver, and tabulates them as bearing relation as follows:—

	Silver.	Carbon.
1st. Softness and delicacy	10	8
2nd. Simplicity of manipulation	10	5
3rd. Uniformity of results	10	5
4th. Economy of production	10	7
5th. Indestructibility	10	6
6th. Permanency	8	8
	58	39

An old photographer at our elbow, as we write, suggests the addition of a seventh item to represent the relation of the writer in question to the two processes:—

	Silver.	Carbon.
7th. Knowledge and experience	50	1

Coming fairly for juxtaposition with this is the testimony in the same journal of Mr. Frank Rowell, the oldest carbon worker in the States. He says:—

"Now allow me to say this: If I had to make a choice, either change my business or go back to silver printing for my enlargements, copies, or any work that I say to my patrons is permanent, and that I am giving them an equivalent for their money, I would make a change at once. Now a word to my brother photographers. If your experience is like my own you will meet any number of people who come to sit to you for a negative. They are to have a crayon portrait, and the artist wants an outline. They do not want a photograph, they fade or turn yellow, and a free-hand drawing can be had (life-size) for twenty-five dollars. They may not be quite as good a likeness as a photograph, but it is permanent. That is about the kind of talk we hear in Boston.

"What I have been trying for years to do is to show work that has all the good points of a photograph, and the permanency of a crayon drawing, or a painting in oil colours. When we all show the kind of work mentioned, photography will have taken a long step from where it is now, and our patrons will not say 'Yes, it is beautiful, but they will fade in time.'

"Now a word about carbon work in hot weather. In the hottest weather of the last two years, besides our own portrait work, we have done two jobs for book illustrations, one of seven thousand and one of three thousand prints, and the failures were not three per cent. Would you have made less failures in silver than we did in carbon? In dull, dark weather we have printed twenty prints from one negative, while in silver the most we could have done would have been four or five prints.

"In my opinion the man or boy who has an opportunity to practise carbon printing, and neglects to do so, stands in his own light, and fearfully so, too.

"In my opinion, the photographer who makes large work from life or copies, finishing the same in crayon or India-ink, and does not print the same in carbon, makes the worst mistake he ever made if he intends to do a portrait business for the next ten years. The opinions expressed are not spasmodic or brought on by M. Lambert or any other parties, but from years of study and experiment.

"I bought M. Lambert's patents, and while he was at our place of business I learned enough to pay the license fee, if the patents are not worth the paper they are written upon. To meet a man who has struggled through the same difficulties you have had, and exchange thoughts and ideas, is often meat and drink to a hungry mind. For one, I am satisfied with the amount received."

VIOLET LIGHT—A HOME WRINKLE.

BY J. CHAMPION BRADSHAW.

I CANNOT refrain from adding my mite to the controversy which has been taking place upon the above subject for so long, half of which is, I think, at any rate, lost time. Although I think our photographic papers have been

giving us rather too much American news lately, yet I must say that I agree with the *Scientific American*, quoted in your last issue, wherein it states that light which has passed through violet glass is in nowise different from white light, only reduced in power. But I have thought for some time that this knowledge might be made very serviceable.

I have no doubt that the majority of photographers have had complaints from certain sitters that "the light was too brilliant," that "it made them feel inclined to shut their eyes, or frown." Now, if this is due to the yellow rays—and I think it is—it would be a very easy matter to have a number of squares of violet glass set in a movable frame underneath the usual glass roof of the studio; and whenever a sitter of this sort had to be operated upon, to move the violet glass to any portion of the studio required, which frame could be moved out of the way when done with. Try it, as our transatlantic wrinkler says.

By-the-way, those wrinkles were amusing, and go to prove that "there is nothing new under the sun," not even that "wrinkle" for copying prints through glass. I have known that to be in general use for the last twelve or fifteen years; but it may have been in use longer. I am but a young man. And the other "wrinkle," for albumenizing plates, I believe has been in general use for a year or two; at any rate, it has been so among the photographers I have the pleasure of knowing. Still I have no doubt there are many people who do not know these things even yet, and therefore their publication in your columns will give them another chance, undoubtedly. As the writer says, "they are very simple." I hope the transatlantic papers will copy.

Correspondence.

MEDALS AT EXHIBITIONS.

SIR,—Unquestionably some good or definite result is achieved by exhibitors when medals are awarded to the most meritorious.

Now, in regard to the last exhibition in Pall Mall, what reward, comfort, or satisfaction was given to anyone? Much trouble, time, and some expense were incurred in preparing and sending the various specimens; and, at the closing of the exhibition, each exhibitor might ask himself, what good have I received? There might have been a little just criticism, but some unfair, some injudicious, some foolish *à la* "the largest circulation in the world." Entire satisfaction to anyone there was none.

The man who sent work of inferior sort could say, like him who sent better, "I exhibited at Pall Mall." They both, so far, stand on a dead level. An annual exhibition of photographs is distinctly different to such an exhibition of pictures as the Royal Academy. Artists who send to the latter have a defined purpose, and expect a definite result.

Realize the idea of an annual exhibition of pictures where artists have no power of selling their exhibits, but must rest content with the faint comfort gleaned from the criticisms of the press! I imagine if that were made the rule of the Royal Academy, the hanging committee, at the time of the next intended exhibition, would have no pictures to hang at all.

The motives of an artist sending his pictures there are, firstly, that they should be admired, and lastly, that they should be sold. Photographers, like artists—I should say photographic artists—like painters, are made up of flesh and blood and bone and sinew, and have the same ambition, desires, and weakness for the substantial. Therefore, if you hold out to them a prize—one that is tangible, that they can see and feel—they will gird up their loins, enter the arena, and go in to win. If you offer a medal, you offer an inducement, a greater number will exhibit, and those who do will be sure to aim high.

But there is yet a matter I would speak upon in regard to the question of medals. There are some of us who do not wait until we can earn or deserve them; and it is this which will make the winning of them "not worth the candle." I allude to photographers exhibiting in their windows medals awarded to other men, and bought from them. One case I could point to where four medals are mounted on velvet, framed and exhibited, and I could tell the source from whence they came. Supposing at the late Edinburgh Exhibition, for instance, I had awarded to me a medal for real and intrinsic merit, and, with pardonable pride, placed it in my window, and my business was situated in the same street as that of the man with the four medals not won by himself. The public, not knowing the two circumstances, would say, "Ah! Signor So-and-So is four to one against you." Why, I should be tempted to throw my medal into the sea.—
TOM DOW.

RAPIDITY IN CARBON PRINTING.

SIR,—I detest having to answer anonymous correspondents. I like to know who it is to whom I am to give information—which I am always most happy to do, if I can—or with whom I am to wage battle.

I am quite a novice, and cannot, therefore, be an instructor in the case of the Lambertype process. However, in my capacity as a juvenile boxer, "H. W." has given me a grand opening to learn how to hit hard in the dark. I do not see my adversary, but I know he is there, and is apparently destitute of science. So here goes.

Can "H. W." read? If so, why does he say "five minutes past eleven," when he can see, plainly printed, in your issue of the 2nd inst., "five minutes to eleven"? Again, he says "sixty-seven minutes," whereas it ought evidently to be seventy-seven minutes, or one hour and seventeen minutes. Again, quoting me, he says, "he saw Mr. Witcomb print three portraits (one of which took three and a-half tints to expose) in carbon," &c. If he or any one else will refer to the same letter, he will find that I said nothing of the sort. I said that these portraits (negatives) were taken *before* the operations commenced on my own two negatives, which were the subjects of trial, and were not ready to be exposed at the same time. If I may repeat, I said, "I saw my own negatives" (not the portraits) "put into the pressure frames," &c. I do not think anything could be clearer.

Again, can "H. W." be a licensee of the Lambertype and chromotype processes? If not, no wonder he is in darkness, and it is not likely that he will be enlightened until he has purchased his full license.

Referring again to "H. W.'s" last clause, has he read Mr. Witcomb's letter in one of your previous issues (I think about December 1st or 8th), in which he gives full information about his queries? It is clear to me, having had only one lesson, so to say, that "H. W." knows nothing about it, and if he does not read a little better and more carefully, he will not get on with his manipulations, and he had better go to the Autotype Company to be taught. Mr. Witcomb is prepared to prove, any day, that he can repeat what he did in my presence before any witnesses. The best plan would be for "H. W.," if he doubts my statement, to bring one or more of his own negatives (as I did), see it put into the pressure frame, and then await the result. If he gave the negative into Mr. Witcomb's hands about noon, he might possibly have time to order and eat his luncheon before he found a print ready for him.

I believe Mr. Witcomb will shortly reveal something more astonishing than anything he has hitherto done.

If "H. W." is only an Autotype licensee, he cannot expect to know or be informed of the perfected processes.—
I am, dear sir, yours very truly,
THOS. PARKES.

PS.—I must for the future decline answering any letter from anonymous correspondents.

I forward you (if you will accept it) a fellow copy of one of the prints done in one hour and seventeen minutes.—
Harrham Cliff, Salisbury, March 10th. T. P.
[The print forwarded is in every way a perfect one.—Ed.]

COLOUR OF CARBON PRINTS.

Sta.—There have been unmistakable indications of late of the aim to produce a curious and monstrous kind of monopoly. The licensees of M. Lambert seem to arrogate to themselves the especial right not simply to use the patents for which they have paid, but the exclusive right to the best information as to the successful practice of carbon printing. Most of them are chary of communicating information, and, what is worse, they are indignant when men of liberal heart, despising this petty exclusiveness, do publish information. There has, I am informed, been a monthly journal established for the especial advantage of these licensees, to be circulated amongst them privately! And I must confess that I am astonished beyond measure that the Autotype Company should lend themselves to such a short-sighted narrowness. It must be to their advantage to extend the practice of carbon printing; whilst this step is manifestly calculated, if it is not absolutely intended, to restrict its practice.

It appears to me that the chromotypists have certain defined privileges with which they should be content. They have the right to use Lambert's patents, whatever these may be, and, if the patents are good, there need be no secrecy; and they have the right to be supplied with a special tissue. My object just now is to urge upon all carbon printers who are not of the Lambert type ring to avoid all resemblance to the colour especially, affected in "chromotypy." Leave it to the exclusive ring. The colour is not really good in any sense, and would never be selected by an artist as the colour in which to produce a monochrome. The reason for its selection, so far as I can see, is its resemblance to the colour of a gold-toned silver print, a colour which has received currency in photography not because it is the most artistic as a monochrome, but because it was the most pleasing tint which could be uniformly obtained in the ordinary process of silver printing. I do not remember ever to have seen a monochrome painted in that colour by an artist who had his pigments to select. Sepia, bistre, and indian-ink are the colours usually employed, and occasionally red chalk for portraits.

Would it not be much better to produce carbon prints in a rich brown, or a rich warm black? These are colours available to all, without trenching on the colour which is assumed to belong to the Lambert type licensees. The Autotype Company could have no difficulty in supplying tissue of such colour; nor could any of the manufacturers of whom rumour speaks as about to commence the supply of tissue, now that the patent for its manufacture is about to expire.

Let me, in conclusion, thank Mr. A. Wallesey Turner, Mr. Witcomb, and the other writers in your columns who have freely communicated their experience, disregarding the petty narrow spirit of others, some of whom have of late loudly paraded their liberality.—Yours,

A CARBON WORKER.

HEALTH OF PHOTOGRAPHERS.

DEAR MR. EDITOR.—Do I look like a man in poor health? Look upon this picture (I now send you), then upon that which is drawn in the News of January 26th, under the title of "Health of Photographers." Is it within the bounds of supposition, I ask you, that I could not get away with a plate of good old English roast beef, and a slice of plum pudding thrown in? If you think so, just order them to be set before me, and then judge for yourself the probal state of my health! And all this from a practical operator who has spent at least a score years in the dark room, and gone through every phase

of the business for thirty-six long years. Since my initiation into the mysteries of the Daguerreotype, I suppose I have inhaled enough mercury to make a shining mirror for others to reflect from, and if it could be possible for a chemist to extract the chemicals and compounds that have made acquaintance with the interior of my dark-room, he might get enough ether, alcohol, cyanide, iodine, gold, silver, bichloride of mercury, bromides and chlorides, acids, and other chemicals of minor note, to open a small stock depôt at a small cost. I admit, a practical operator is apt to get his fill of such things, if he is not very careful, that might over-develop him; yet there is such a thing as neutralizing the bad effects of such compounds by seeing to the ventilation of the dark-room, and having it in such a position as that the fresh air can at all times have access to it. The photographic gallery, especially the dark room, is not the most desirable place to keep the system healthy; yet, with a little care and attention, you may keep in as good condition as regards health, as in almost any other business. A few hints from me with your permission, may not be out of place to young heads, or even to some older ones.

First, always have a window in your dark-room, if at all possible, that opens out into the air. I have seen many dark-rooms with light admitted through windows into the skylight or operating rooms. Such rooms are always unhealthy, and, in time, will break down the best and strongest constitution of any operator. Fresh air is the most important point to be gained to secure health and retain it. Next, never mix your chemicals in your dark-room if they will admit of being mixed out of it. Never let the current or draught of air in your dark-room strike any of your chemicals before it does yourself. For instance: how often have I seen operators coat their plates holding them up between themselves and the light, little thinking by that means the draught from the window caused them to inhale the poisonous vapours of the collodion! Another bad practice is cleaning the fingers with cyanide between the light and the sink; even if the window is not open, the fumes generate through the room, which is slow death to the inhaler, and often produces that sickly feeling at the stomach and dizziness in the head which nearly all experience who use it. I have been there.* After handling cyanide, or cleaning the hands with it, rinse them off with a little of your iron developer, and it will neutralize any of the traces of cyanide that may be left on your hands. Leave your dark-room window open at night, both winter and summer—a little in winter will do—so that the poisonous fumes of the chemicals will be neutralized by morning. Never leave lumps of cyanide lying round your dark room. Keep all your chemical bottles tightly corked, and keep none in your dark room except what you really need. Make a practice of mopping, wiping, or sprinkling your dark room occasionally, as it will tend to purify it. Never take a nap in your dark room by any means. Exercise in the open air as much as possible after working hours, even if you are tired (that is, those who are confined very much in day time); it will tend to refresh the system. In summer, if at all practicable, and your pocket can stand the pressure, take a respite for a month from the cares of business—and you do not know (those who have not tried it) how good you will feel even if it be but for a few days—and, take my word for it, many of you will be healthy, fat, and jolly, as I am now at just threescore years of age. So

* During one of our excursions to a country town in the middle of summer we were planning up a 16 by 17 negative plate with cyan de. The dark room was small, and we don't recollect how many degrees the thermometer was from zero, but the first thing we did recollect was, Mr. Cyanide floured us, and if Mr. Developer had not been handy, most likely we should have not been here to relate this little anecdote, and the tanned Mr. O. and I had between themselves with our humble self; but our anecdote happened to be at hand to see fair play, and after the first knock down we began to develop that we had something for dinner. The assistance of Dr. Cyanide was called in, and he elevated us again; after that we looked more to our old friend Hyge for support. In developing negatives he has never floured us, and we intend to stick to him in the future.

see to it, ere it be too late, for health is the greatest boon of our life; when we have that we enjoy all things else in proportion, even to following and practising the beautiful art of catching shadows ere they fade.—Most respectfully,
J. H. FITZGIBBON.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting was held on the evening of the 13th inst., in the Water Colour Gallery, Pall Mall. Mr. J. GLAISNER, F.R.S., occupied the chair. The minutes of a previous meeting were read and confirmed.

Mr. SPILLER then read a brief paper to open the discussion upon the Nitrate Bath: its Defects, and the Remedies. He described the results he had obtained from examining the precipitates forwarded to him by Mr. York and Mr. H. J. Burton, of the Autotype Company. The latter gentleman always added cyanide of potassium to his bath; he found cyanide of silver in the deposits. Besides the iodide and bromide of silver, which he had expected to find precipitated from supersaturated baths, he had also found sulphate of silver. The presence of this salt, as a cause of pinholes, explained the action of the remedy proposed by Mr. Henderson, which proved effective. He must not omit to mention that he had ascertained, in conversation with Mr. Wharton Simpson since he arrived this evening, that Dr. Hermann Vogel originally proposed this remedy, which, of course, wherever sulphate of silver was present, would prove efficient. Sulphur doubtless found its way into the nitrate bath from various sources, the chief of which was probably the impurity of the iodide of potash used in the collodion, sulphate of potash being a common impurity. The nitrate of silver used by photographers was often made from reduced residues, which would almost invariably contain traces of sulphur. He had not found fulminating silver in the precipitates, as Mr. Warnerke had done, nor had he found oxalates, or other salts of silver.

Mr. WHARTON SIMPSON, in answer to the Chairman, said that he did not remember any details of importance beyond the fact that Dr. Vogel had, about ten years ago, suggested the use of a baryta salt as a cure for pinholes.

COL. STUART WORTLEY was unable to be present, but sent the following remarks, which he had intended to have made:—"The bottle I produce before you to-night contains an ethereal solution of nitrate of uranium, which has been exposed for a short time to the action of light. The action of light upon this solution throws down a deposit of urano-uranic oxide, leaving the supernatant liquid in the proper state either to be added direct to the collodion, or, after the salt has been crystallized thereout, the salt will be in a fit state for adding to the nitrate bath. I will not trouble you with unnecessary chemical details, and will therefore simply state that if commercial nitrate of uranium is added to the silver bath, the bath is injured rather than improved, while if the purified salt is added a considerable increase of sensitiveness is the immediate result. It will be remembered that when I first proposed the addition of nitrate of uranium to the silver bath for wet work, it unfortunately attracted the attention of a photographer who made trial of the process in ignorance of the qualities of the salt with which he was working, and also, apparently, in ignorance that both Herr Wortley and myself had pointed out the necessity of purifying the commercial salt previous to using it. The photographer in question added the commercial salt direct to his bath; hence his failure to appreciate the value of nitrate of uranium added to the ordinary silver bath. Fortunately, however, Mr. Peters and other gentlemen approached the subject, bringing to bear upon it the knowledge and thought that were not shown in the work of the before-mentioned photographer, and a record of their success having been published in the PHOTOGRAPHIC NEWS, the process is now gradually coming into use, and from many letters that I have received appears to be looked upon with favour. This may probably be a good opportunity to call attention to a subject which frequently crops up in photographic discussions, namely, the relative sensitiveness of the wet and dry processes; and as I have made a very large number of comparative experiments on this point during the past few years, I think I am in a position to give an opinion on the matter. We see sometimes statements that certain dry processes are two and even three times as sensitive as the wet, but I have never been able to confirm such a statement. On the contrary, though a dry plate can be made slightly more sensitive than a

wet plate, as prepared by the ordinary processes in use, if an extra sensitive wet process is used, such as a heavily bromized collodion, sensitized in a uranium and silver bath, the dry plate can no longer keep up its superiority. It would in my opinion be most interesting were the Photographic Society to appoint a committee to investigate this subject of relative sensitiveness. It would of course be necessary to keep to published processes, as it would not be of interest to the general body of members for secret formulae to be brought into the competition.

Mr. WM. BEDFORD asked if there was any wisdom in using nitrate of baryta. Until its use had become somewhat common such heavy deposits in the nitrate bath were unknown. He had prepared some nitrate from reduced silver residues, and by selecting the largest of the first crop of crystals he thought he avoided sulphate of silver.

Mr. S. G. PAYNE, of Aylesbury, said Mr. Spiller had referred to the use of cyanide in the silver bath as a comparative novelty. He remembered that something like twelve years ago he accidentally added some cyanide, with beneficial results. Mr. Wharton Simpson would doubtless remember that he sent him the details at the time, and that he replied that an accidental or empirical addition of the kind not unfrequently proved useful, even where no theoretical explanation seemed applicable. Mr. Payne went on to describe a case in which a bronze penny accidentally fell into the bath, which, however, after filtering, worked admirably.

Mr. SAWYER said as the able gentleman referred to by Mr. Spiller was not present, he would, in his name, as well as for himself, make one or two remarks. In their experience at the Autotype Works, pinholes were always the result of those small crystals visibly present, and which were doubtless crystals of sulphate of silver, or some other salt of silver which should not be there. Sometimes they found that simple filtration would remove these crystals, but not for long. He had an impression that their origin was often the presence of sulphuric acid in imperfectly washed pyroxyline; and thought that if a salt of barium—say the chloride—were added to the last washing water used when the pyroxyline was made, that this would prevent the formation of crystals of sulphate in the bath. As regarded cyanide, they always used it in the bath, believing it gave better results when so treated. In making a bath, they used common tap water. To this they added about one-tenth of its bulk of old bath solution, and exposed the whole to light and air. They then added nitrate of silver to make up the strength, and sufficient pure recrystallized cyanide of potassium to produce a slight cloudiness. It did not need iodizing, for it contained a portion of old bath. Of course old solutions would still accumulate on their hands, and these they evaporated and recrystallized, and carefully washed the crystals. Baryta had not proved useful in their hands. On the whole, they found the nitrate bath easy to make, and not difficult to keep in order.

Mr. BLANCHARD felt it right to say that as he was with Mr. Peters when the experiments were made with uranium in the bath, it did not increase sensitiveness, as Col. Wortley thought; it rather retarded; but it did improve the colour of the negatives. Regarding the nitrate bath generally, he had great faith in simple water and nitrate of silver without anything else. He detailed an experiment in which he improvised a new bath of simple water and nitrate of silver to work against a bath treated by a secret process which was offered for sale. His simple bath proved much the best. Mr. Taylor and Mr. Wharton Simpson were both present, and could bear testimony to the fact.

Mr. WROGE said he had no intention of speaking, but as he was referred to by Col. Wortley as an ignorant photographer, he would simply remark that, having tried the Colonel's suggestion, he published the details exactly as they occurred. He was subsequently told that he should have tried, especially, purified nitrate of uranium, and had done so, and found no increased sensitiveness whatever.

Mr. ENGLAND, like Mr. Blanchard, had great faith in simple water and silver. He liked to sun the solution after it was mixed, as he generally found that this eliminated some trace of impurity which had been present.

Captain ABNEY said that his name had often been mentioned in connection with the wretched uranium controversy. He had used it in the bath, but found no advantage in it for the wet process; but in the dry process it undoubtedly gave greater sensitiveness. Regarding sulphate of silver, he feared that sulphuric acid left in the pyroxyline was not uncommon. Wherever the deep brown colour was struck as soon as the collodion was mixed, it was probably due to this acid.

Mr. WROGE knew nothing of the effect of uranium in dry plates.

It was solely in relation to its effect in the wet process that he had reported.

Mr. YORK read a paper describing his experiences with pin-holes.

After some conversational remarks on fulminating silver,

Mr. SPILLER, replying to Mr. Payne's question, said that the action of the penny on the silver solution would be to throw down some metallic silver, and form a little nitrate of copper; and it was possible that if a bath were in a condition having a tendency to fog this might improve it.

A GENTLEMAN who had spent some time in New Zealand narrated some experiences. He had at times been able to get no nitrate of silver but ordinary caustic, and had got good work. He preferred water from a granite rock to make the silver bath with when he could get it.

The CHAIRMAN referred to the advantages of rain-water after the first shower had cleansed the atmosphere. He then proposed that the thanks of the meeting should be given to Mr. England, the Autotype Company, Mr. Bedford, Mrs. Payne, and others, for their contributions towards covering the walls of the room. The pictures of the water-colour artists having been removed left the walls bare-looking, and a number of members had contributed pictures to obviate this. The president, Mr. Glaisher, had sent fifty very fine large prints of ferns, which he had produced twenty years ago. These were fine prints, and in excellent condition.

Captain VERNEY was proceeding to propose that an album should be kept for Society pictures, when

The CHAIRMAN intimated that no motion of the kind was admissible at an ordinary meeting. A letter should be sent to the council.

The proceedings then terminated, the Chairman calling especial attention to the fact that the next meeting would be on the first Tuesday, not the second Tuesday, in the month. The meeting would be on the evening of April 3rd, Easter Tuesday.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held in the Hall, 5, St. Andrew Square, on Wednesday evening, the 7th inst., Mr. LESSLE, President, in the chair.

The minutes of the previous meeting were read and approved, and Messrs. James Forbes, Crooke, John Crichton, W. B. Mitchell, Archibald Robertson, Purves, and Kirk were admitted ordinary members.

Mr. JAMES CRIGHTON then read a paper entitled "Our Out-door Meetings" (see page 122).

Mr. W. NEILSON said he had listened to the paper with much pleasure. He had some experience of the out-door meetings, and thought they were a feature of the Society that should be encouraged as much as possible, and nothing left undone that would draw out the members. He noticed that those meetings were intended to take the place of certain of the ordinary meetings during the summer months, and would like to know if it was the custom to transact business at such meetings, as if so, it might be that matters of much importance would be decided by a comparatively small number of the members of the Society.

Dr. NICOL replied that for a number of years it had been the custom of the members at the out-door meetings to constitute themselves into an ordinary meeting, and transact any business that might require attending to; but with the exception of the election of candidates for membership, almost nothing else was ever done. He thought it might in the future, as it had in the past, be safely left to the good sense of the members who were in the habit of attending such meetings, to do only such business as might turn up that could not be allowed to be over till October.

Mr. DOBBIE had always found a difficulty in finding suitable places at which to hold the out-door meetings, and thought it would be well if the members generally would send suggestions to the committee to assist them in making arrangements. Unfortunately for himself, his business engagements prevented him getting to as many of those meetings as he would like, but from his experience of those he had attended he could assure the members that they were very enjoyable.

Dr. THOMPSON was very glad that Mr. Crichton had brought forward the question of out-door meetings at the beginning of the season, as he was sure that members only required to be induced to attend one to secure their presence at all. It was no doubt a matter of importance to select suitable places of meeting, and equally important to have arranged as far as possible the order in which the pictures should be taken, as, generally speaking, there was some particular hour at which each view could be

better photographed than at any other. If the out-door committee could previously visit the ground, and arrange as to time and place, much valuable time might be saved.

Mr. SINCLAIR highly approved of the proposed method of increasing the interest attached to the out-door meetings, and gave notice that at the next ordinary meeting he would propose that an award be offered for the best pictures taken at such meetings, and that it be remitted to the council to consider and report as to how the arrangement should be carried out.

Dr. NICOL gave notice that at the next meeting he would move that a medal be offered for the best paper that should be read before the Society during the current year.

A number of prints contributed by Messrs. Nimmo and Son were then ballotted for, and the President intimated that at the next meeting Mr. Rodger, of St. Andrew's, would read a paper, and give practical illustration of the platinotype process.

Votes of thanks were given to Mr. Crichton and Messrs. Nimmo and Son, and the meeting adjourned.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held at the Odd Fellows' Hall, Bradford, on Monday, the 5th inst., Mr. E. WORMALD in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Mr. Doar, Bradford; Messrs. J. W. Sykes and Jno. Garrett, Dewsbury; and Messrs. L. Abell and Turner, Leeds.

Mr. A. CRABTREE then gave a lantern exhibition, using a pair of the newest lanterns out. A good assortment of slides was shown, comprising Continental, American, Irish, and a few, by some of the members, of Yorkshire scenery.

A vote of thanks was given to Mr. Crabtree for his entertainment, and the meeting then adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A SOCIAL meeting of this Society was held on Thursday evening, the 8th inst., when about fifty members and friends partook of an excellent "knife-and-fork" tea. In the absence of the President through domestic affliction, Mr. THOMAS HEYWOOD, Vice-President, occupied the chair.

After the routine business had been disposed of,

Mr. W. T. CHADWICK exhibited and described a new form of oxygen generator (in our next). He also exhibited some charming little views by Mr. Woodbury from emulsion negatives, and mounted by Mr. Woodbury's new corner pieces on a large card. These views were greatly admired, and the method of mounting generally commended.

Mr. FRANKLAND exhibited several of Mr. Wendel Holmes' stereoscopes, which were quite new to some of the gentlemen present.

The walls were adorned by ten large (about twenty-four by nineteen) pictures from wet collodion negatives, by Mr. Wormald, of Leeds—very fine and perfect specimens of large work, and which excited considerable interest. The walls were also embellished by a number of Mr. Coote's well-known excellent pictures.

The meeting then adjourned to the lantern room, where Mr. Chadwick had a pair of Mr. Woodbury's lime light sciopicons, and exhibited a large number of fine views kindly sent by Mr. F. York, of London, for the occasion. Several dozens of pictures by members of the Society were also shown.

A vote of thanks was passed to Messrs. Chadwick, Wormald, Woodbury, Frankland, and Coote, and one of the most enjoyable meetings the Society ever held was adjourned.

Talk in the Studio.

CATALOGUE OF APPARATUS.—We have been favoured by Messrs. Watson and Sons, of High Holborn, with a copy of their newly issued catalogue of photographic apparatus, which contains an unusually large stock of lenses by the best makers at reasonable prices, as well as cameras and other photographic appliances. Photographers wishing to extend their stock of apparatus will do well to consult this catalogue before purchasing.

PHOTOGRAPHIC REPRODUCTION OF BANK-NOTES.—Photographers are certainly very clever people. The most recent feat that they seem to have successfully accomplished is the reproduction of the blue notes of the Bank of France and the red ones of some of the Scotch banks. Both red and blue have

The Photographic News, March 28, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Sketches of Fancy, and Photographs of Fact.—"She is exactly like her photograph," said a lady at the theatre in the next stall to our own, who had been gazing for some time at H.R.H. the Princess of Wales, through a large double-barrelled instrument. We think the lady was a bit disappointed, on the whole, for she had come, as we overheard her saying, for the express purpose of seeing Her Royal Highness, and there was really nothing to look at, beyond what a photograph in the album at home had shown her. The amiable face of the Princess we have seen so frequently depicted by photography that it seems quite familiar when we look upon it in the Royal box or elsewhere. There is certainly less romance, now-a-days, surrounding the persons of princes, princesses, and other great people, than before the days of photography; but if we have lost something in this respect, the balance of advantage is immeasurably in our favour. The disappointment of the lady to whom we have referred would, after all, soon be counterbalanced by the reflection that the photographs of other great personages in her album equally resemble the originals, and thus she may in the future be quite satisfied that she knows what they are like, without taking the trouble to run after them. Indeed our fair neighbour could not have expected to see much more than she did, and if questioned would doubtless have been puzzled to define the something which she anticipated. The stout, good-humoured appearance of the Prince would, if she had reflected a moment, have been equally satisfactory, for the blame, if any blame was to be awarded, should be put upon photography for representing so trustworthily the illustrious personages, without favour or disfavour. It has simply put before our eyes the portraits of a man and woman, and some of us have an idea that princes and princesses are something more than this. Whether the recollections of childhood's stories still linger in our minds, or that we are naturally inclined to romantic fancies, certain it is that many cannot quite get over the notion that princes usually go about in long hose, and pink silk jackets, with feathers in their hats, and ribbons on their shoulders. We used to read about them thus in our early books, and our ideas upon the subject were confirmed by the extravaganzas and pantomimes that we witnessed. Princesses were always beautiful in those days, and it was only the curdmageons of step-mothers who were at all ugly and ill-favoured. Indeed the idea is so firmly rooted, that it is no uncommon thing to hear a person, examining some princess's portrait for the first time, exclaim, "I don't call her pretty at all!" as if, being a princess, she must perforce be good-looking. A contemporary is just now engaged in the issue of a series of portraits called the leaders of society, and we are treated week after week with fair members of the aristocracy, who, however much they may differ from others in dress and pose, have invariably one thing in common—they are all handsome. We are not going to deny that there are fine and charming women among the "upper ten;" all we take exception to is, the universal beauty supposed to exist among the favoured few. Such representations as these sometimes make us wish that photography had never been invented to deceive us. Look at the old engravings of slight damsels with high waists and quaint top-knots that figure in the print-shops around Covent Garden. They are all Countesses, or Lady Sophias, or Honourable Misses, and they are all surpassing fair. No wonder our fathers and grandfathers had wonderful ideas of the charms of high-born ladies. Photography has swept away all this romance, and a lady of the *grande monde* has to take her chance with the rest of her sisters. She is photographed, and, let the portrait be touched or untouched, one gets a

very good idea of her claims to be considered a beauty. Nor is it only in the matter of personal charms that photography has stepped in to tell us a word of truth. In other connexions it is equally frank. The magnificent sights, the lofty waterfalls, the gigantic glaciers, the dangerous passes, and the thousand and one objects about which travellers were wont to tell wonderful stories, and of which sketches would bring us home pictures that would admit of no doubt, have materially decreased in number and importance since the cultivation of the black art. The account of our friend Brown's villa in the country, of his conservatory and flower-buds, of his fishpond and pine-houses, his shrubbery, stabling, and all the rest of it, is all very well; but when, after his glowing description of them, we see a photograph which some itinerant operator has executed for a shilling, we are hardly so much impressed as we were before. There is a garden, certainly, and a cucumber-frame—we mean conservatory—but not of the dimensions we imagined them. Of course it is our imagination that is to blame under the circumstances, and it is a good thing, therefore, if we are prevented from going astray by the aid of a photograph. We have an acquaintance whose whole leisure is taken up with yachting, and when he can spare a moment from stock-broking, he is off to Erith, where his vessel lies, for a cruise. The many times he has invited ourselves to a trip made us some time ago seriously consider about whether we should not join him for a few days' trip. Albeit a bad sailor, we could not resist his accounts of adventures of a run down the Thames to Margate or to Deal, sleeping and eating on board as comfortably as in an hotel. He had an experienced mariner who acted as master, and the latter's qualifications for that post were amply proved by the many cups he had won at races and regattas. If we liked, we should run over to Boulogne or Dieppe, or into some quaint little seaport in Normandy, and look at the pretty French fishwomen in their striped petticoats. Such an invitation as this one could scarcely refuse; but before venturing, we fortunately caught sight of a photograph of the yacht lying off Barking Creek. Adieu romances and sun-lit waves, picturesque Normandy and bonnie fishwives. The picture showed a large row-boat, or something of that sort, rigged, with an untidy sail. There was a cabin, it is true, where one could sleep, but only a part at a time. Head or feet must, perforce, be exposed à la belle étoile, and in a heavy sea you would have to sit with an arm round the main mast to prevent slipping into the sea. Our trip to Boulogne is as far off as ever, and we bless photography to this day for saving us the trip. Therefore, we say, if the camera has robbed something of the romance of this world, we must remember that it has given advantages which more than compensate for the loss, for there are times when we like to get at the bottom of a thing without desiring to go so far as to descend into a well.

A NEW OXYGEN RETORT.

BY WILLIAM J. CHADWICK.*

In bringing before your notice a new oxygen retort I do not claim the credit of any great invention, but simply an improvement in one or two respects upon what we have previously seen.

My improvement consists—Firstly, in making the oxygen mixture in the form of cakes instead of plugs or cylinders, as were first introduced by our friend Mr. M. Noton. Secondly, in the shape of the retort, which is made so that the cake lies upon the bottom, and is only in contact on that side. Thirdly, in making the cakes with the bottom bearing on the retort, to consist simply of manganese, sand, or other substance containing no chlorate of potash, upon the top of which is placed the oxygen mixture, still forming one compact cake. Fourthly, in the perforating of the cakes.

* Read before the Manchester Photographic Society.

image is not more capable of being photographed than the combined colours of which I have just spoken.

An artist engraver produces, in the first place, a relief—either ornament, bust, or head—and of this impressions are prepared in plaster of Paris to which a little red has been added. As many impressions are set up as you desire to have bank-notes on the same printing block, and these impressions are photographed, lighted up sharply from the side. From the negative so taken a Lichtdruck cliché, and in this way a print in blue and red in half-tone, may be secured.

M. Jaffé concludes his paper by stating that if the Lichtdruck process is not far enough advanced at present to produce the perfect prints necessary in the preparation of bank-notes, a combination of photography and mechanical means could be contrived to produce the necessary result.

ON A NEW CAUSE OF PINHOLES AND STREAKS AND ON THE ACTION OF NITRATE OF BARY IN THE NEGATIVE BATH.

BY DR. H. VOGEL.

[WHILST the negative bath and its troubles attract the attention of photographers, it may be attached to the right to reproduce the article by Dr. Vogel, or placed upon a referred in our last, as having appeared.

Years ago in the PHOTOGRAPHIC top portion of the retort an inch it covers much more conveys the gas direct to the gas holder of the Photash bottle, as shown us three meetings ago by Mr. Ponsa for preventing the return of the gas and back pressure, may be used, or an ordinary back pressure valve or an ordinary tap.

The object of using cakes of the above description is that they leave the retort perfectly clean; for, as it is the chlorate of potash that fuses and sticks to the retort, the manganese or sand which forms the bottom of the cake, and is the only portion in direct contact with the retort, is a sure means of preventing any sticking. This plan I also adopted in the case of plugs or cylinders. The perforation of the cakes is simply to facilitate the generation of the gas.

There are other advantages to be derived from the use of this apparatus. As this is more of a social meeting than a scientific one I will not detain you longer, but to anyone interested I shall be glad to show the apparatus at work later on in the evening.

THE BLUE GLASS DECEPTION.

THE *Scientific American* resumes its remarks on this subject. It says:—

"In our last issue we reviewed the alleged capabilities of sunlight filtered through blue glass in causing plants to grow, &c.; and, by reference to numerous experiments, we reached the conclusion that the light transmitted through the violet-blue glass is nothing more than normal sunlight diminished in intensity. We propose in the following to finish our discussion by examining into the effects of light and darkness upon organisms. And we may especially here recall the fact that General Pleasonton claims that not only does the blue light stimulate growth, but that it is a positive remedial agent for such severe ailments as spinal meningitis, nervous irritation and exhaustion, rheumatism, hemorrhage of the lungs, deafness, partial paralysis, shock due to severe contusion, and others, of all of which he cites cases.

"The theory that various coloured lights exercise different effects on the human system is an old one. In 1831 Dr. Newbery asserted that yellow light stimulates the nervous, pink the nutritive, and blue the locomotive temperament; and recently Dr. Ponsa, an Italian physician, has asserted that lunatics are greatly affected by being placed in different coloured rooms. Red light, Dr. Ponsa

Of course such a secretion of crystals of acetate of silver on the collodion film has been repeatedly observed by us and others. These, however, occasion not so much pinholes, as "spears, crosses, and swords," the needle-shaped crystals attaching themselves to the film either singly or with several crossed together, and hindering the action of the light.

Our attention was lately directed once more to this point by a letter from Herr Krüger, of Schwerin. He sent two samples of crystals which had precipitated themselves in his silver bath, and wrote that he had been annoyed the whole summer by pinholes in crowded appeared after two days' use of frames, where the light of when it contained little iodine. The total exclusion of question had secreted an impoverished and disordered one of the blood, emaciation, muscular debility, and the I examined due to imperfect nutrition.

few. On the other hand, it is known that for certain purposes, darkness or shaded light is advantageous to the bodily condition. Fowls, for instance, may be fattened much more rapidly in the dark, and it would seem that the absence of light exercises a very great influence over the power possessed by food in increasing the size of animals. It likewise seems to exercise a soothing and quieting influence, increasing the disposition of animals to take rest, making less food necessary, and causing them to store up more nutriment in the form of fat and muscle. Now, if the organism to be treated is subjected to light all of which is filtered through blue-violet glass, then, as we have previously demonstrated, it is in light which is considerably shaded. And very probably to this cause—and not at all to the peculiar hue of the light—is to be attributed the quieting influence on nervous and insane people which Dr. Ponsa has remarked.

"But General Pleasonton does not use blue-violet glass alone. On the contrary, he employs a combination of blue light and pure sunlight, the latter very much preponderating. In his graperies, for example, only every eighth row of panes is blue. The mingled light consequently is merely pure sunlight, very slightly shaded; and the animal or plant exposed simply takes a sun bath—the solarium of the ancients, who, knowing the vivifying influence of the sunbeams, had terraces built on the tops of their houses, so that they might bask in them. This sun treatment is now frequently recommended by physicians for nervous diseases. Dr. Hammond, in one of his lectures, says: 'In convalescence from almost all diseases, it acts, unless too intense or too long-continued, as a most healthful stimulant, both to the nervous and physical system. . . . The delirium and weakness, by no means seldom met with in convalescents kept in darkness, disappear like magic when the rays of the sun are allowed to enter the chamber.'

"To recapitulate in brief, General Pleasonton's claims of any superior powers for blue glass on account of the colour which it produces in transmitted light are, when tested by the result of previous investigations, unfounded. In some instances, where it is desirable to reduce the intensity of the light, blue glass may be used; but any other mode of shading the light, as by ground glass, thin curtains, &c., would without doubt serve equally as well. The cures produced are ascribable to two causes: first, to the healthy influence of the sun bath, and secondly, to the very powerful influence of the patient's imagination. There are abundant cases known where imagination has so powerfully affected the body as to cause death. "Experiments upon criminals have shown that in one instance, where a person was placed in a bed which, he was informed, had just been vacated by a cholera patient (but which had not), he exhibited all the symptoms of that disease. Another person is reported to have shown all the signs of collapse from loss of blood, from the suppositious idea that he was bleeding to death. As regards the animals fattened under the glass, all the circumstances go to show that the result

sulphate of soda was made, the evaporated water replaced, the whole filtered, and allowed to cool for twelve hours. Small crystals had then secreted themselves on the surface. Several prints made in this bath showed very numerous pinholes. Now this bath was free from iodide of silver, apart from the small quantity which is dissolved in sensitizing; the pinholes accordingly could not proceed from it. It is therefore established beyond all doubt that pinholes are occasioned by sulphate of silver.

However, in the case of this bath, another clear, worm-shaped lines.

A LITTLE while ago I published an incident which I publish my researches upon the Herr Benque colours, which I had undertaken in several prints, view to the production of cheques and other papers, which could not possibly be reproduced by photography. My experiments were simply confined to the ordinary practice of photography, but I conducted them in a particularly searching manner, by reason that information had reached us from the directors of the National Bank of Austria to the effect that the blue bank-notes of France, which hitherto had been considered incapable of being reproduced by photography, had nevertheless been copied by the camera.

I obtained a table of colours which displayed most of the different pigments in a perfectly pure condition in their various phases. This table was particularly suitable to my purpose, for the letters formed by the colours upon a white ground permitted the making of a very uniform comparison, for I had every colour in juxtaposition with white, and could therefore study each effect upon the negative. I made several copies of this table, giving various exposures.

Even the most light-powerful, an impure violet, showed very materially on the white in the photograph, and the cobalt blue behaved in like manner, the latter being the pigment employed in the bank-notes just mentioned. The contrast of the other colours was greater, and they were therefore less interesting from my point of view. From this fact I came upon the process which it is most likely forgers have employed in their work.

It is highly probable that if anyone succeeded in producing a copy from a bank-note printed in cobalt-blue by means of the camera, he had to make use of a very complicated process. He required to have engraved plates, for instance, which he would secure by means of photography. If a blue image printed upon white is capable of giving an image, the latter would nevertheless be much too weak for the direct production of a printing-block. A phenomenon which is generally regarded with dissatisfaction by the photographer is, however, in this particular instance taken advantage of, in all probability, namely, the circumstance that a diapositive of a portrait, or any other picture in half-tone, secured in the camera, is generally harder and flatter than the original negative, and the circumstance also that a negative produced again from this diapositive will lie still more hard and flat.

If we now suppose for a moment that the vigour of the deposit upon our negatives is divided into degrees according to Dr. Vogel's photometer scale, and we put the difference between cobalt blue and white at 2°, then a diapositive produced in the camera will bring this difference easily as far as 4°. The negative from this diapositive will possess 8° of density, and this degree is at once brought to 16° by securing yet another image. As probably 20° of density will suffice for the production of a printing-block, such a deposit is secured with but little difficulty obviously. The exposure must always be shortened with every operation, so that the deposit, which was at first produced by the blue ground, becomes gradually less.

* Photographische Correspondenz.

0.25 per cent. sulphate of silver), was now mixed with $\frac{1}{2}$ per cent. nitrate of baryta, and treated just as above.

The result was the same. I obtained a plate of extraordinary intensity, somewhat hard in the lights, but with many fine details in the shades (of the original), finer than with an ordinary bath. The intensity of the plates made in the second bath surpassed that of those made in the first (which also contained less barium).

I must conclude from these experiments, several times repeated, that nitrate of baryta in the negative bath increases remarkably the intensity of the plates.

It should only be added, however, in a very small proportion to the silver bath, for it belongs to the salts which are difficult of solution in water, and which are precipitated in crystals by alcohol.

If a bath, therefore, contains much barium, the latter is precipitated by the alcohol of the collodion film, and occasions, like all precipitates of that kind, pinholes. With the use of a bath containing much barium, these pinholes could appear to a remarkable extent.

prevent photography, for visible to the negative. But MS FOR PHOTOGRAPHERS.

becomes yellow; become legible, and If silver prints are washed berylation taught me to direct room, numerous little air- which are as inactive as the tint. These remain often theless, appear light to the eye, and stand me, in fact, of covering cheques all of which are inactive colours, the writing and figures being in black ink. I took, therefore, my colour-table in hand once more, and painted upon the yellow, green, and red squares some characters in Indian-ink, and in this condition proceeded to take a photograph of it.

Upon my negative the contrast between the black and cinnabar, orange, metallic-green, and especially light chrome-yellow, was very little. My satisfaction, however, was exceedingly short-lived, for I remembered Dr. Vogel's proposition to employ coralline and aniline green in collodion to render it more sensitive to red and yellow rays. By employing tinted collodion and coloured plates, it was obvious that more marked contrast is to be secured in photographic clichés, and in this way, no doubt, a negative of a cobalt blue cheque could be secured with the proper contrast without recourse to the elaborate process previously suggested. Finally, therefore, I resolved upon employing mixed colours in such a way as to thwart the photographic reproduction.

As I was at the time engaged in lithography and Licht-druck printing, I availed myself of the opportunity to produce results which baffled all results at copying with the camera, and which were secured by printing one layer of colour over another.

I found out a whole series of such combinations, but will only allude to a few of them, namely, cobalt-blue upon light yellow, dark-blue upon green, cinnabar upon chrome-yellow. All these resisted the effects of photography, even with the addition of pigments to the collodion, or the employment of coloured glass plates, because the lower colour is scarcely perceptible to the naked eye, and only shines through the upper one, rendering this rather more actinic.

In this way, therefore, valuable documents may be produced which cannot be photographed. Upon a coloured basis may be printed any type or engraved plate by any of the processes in general use for such work.

But I was enabled to arrive at the goal in another way. I was convinced that while cobalt blue, when in the form of strokes and patches (as it appears on French bank-notes), does not present any insuperable difficulty to the photographer, it is different when the cobalt image is printed in half tone. Printed in lighter and darker tints of blue, the

image is not more capable of being photographed than the combined colours of which I have just spoken.

An artist engraver produces, in the first place, a relief—either ornament, bust, or head—and of this impressions are prepared in plaster of Paris to which a little red has been added. As many impressions are set up as you desire to have bank-notes on the same printing block, and these impressions are photographed, lighted up sharply from the side. From the negative so taken a Lichtdruck cliché, and in this way a print in blue and red in half-tone, may be secured.

M. Jaffé concludes his paper by stating that if the Lichtdruck process is not far enough advanced at present to produce the perfect prints necessary in the preparation of bank-notes, a combination of photography and mechanical means could be contrived to produce the necessary result.

ON A NEW CAUSE OF PINHOLES AND STREAKS, AND ON THE ACTION OF NITRATE OF BARYTA IN THE NEGATIVE BATH.

BY DR. H. VOGEL.

[WHILST the negative bath and its troubles are under the attention of photographers, it may not be inappropriate to reproduce the article by Dr. Vogel to which we referred in our last, as having appeared upwards of eleven months ago in the PHOTOGRAPHIC NEWS. It is curious how thoroughly it covers much of the ground traversed at the last meeting of the Photographic Society.—ED.]

Among the many defects in the negative process, none is so frequent as pinholes in the collodion film. Every photographer is familiar with these troublesome spots, which are most prone to make their appearance in the case of old silver baths, and the chief cause of which, apart from dust, is the iodide of silver dissolved in the bath, which finally (when the bath is saturated with it) tends to crystallize in combination with nitrate of silver, adheres to the collodion film whilst in the bath and during the development, and finally leaves behind a small hole, at first scarcely visible, but coming out more clearly by contrast when the print is strengthened.

Two years ago we devoted special attention to these precipitates of iodide of silver, and made several remarkable observations, which threw light upon the action, hitherto in so many particulars obscure, of old silver baths.

We showed at that time that iodide of silver is less easily soluble in heat than in cold, and that, therefore, on hot days silver baths soon become turbid, and grow clear again by simple cooling. We also showed that iodide of silver is more easily soluble in acid and alcoholic baths than in those containing only pure water and the silver salt.

Hence was easily explained the formation of pinholes in the heat of summer, or after the neutralizing of the bath; and our friend Mr. Wharton Simpson showed the correctness of our results in a series of comparative experiments.

Singular phenomena still, however, presented themselves, which could not be harmonized with this theory of the formation of pinholes.

Herr Kurths, of Magdeburg, wrote to us, that at a low temperature (4°) he had found pinholes, which on warming the bath to 12° disappeared. A similar announcement was made to us by Dr. Lorent, of Maimheim.

The combination of iodide and nitrate of silver could not be the sole cause of these phenomena, for at a low temperature it not only does not precipitate itself, but even dissolves, as may easily be observed on the cooling of a bath that has become turbid in the heat.

We sought the further cause of the defect in other salts scarcely soluble, which dissolve less readily in cold than in heat, and must therefore precipitate themselves on cooling; the acetate of silver, for example, which originates so easily in the bath through the adding of acetic acid, or through the decomposition of the alcohol contained in it.

Of course such a secretion of crystals of acetate of silver on the collodion film has been repeatedly observed by us and others. These, however, occasion not so much pinholes, as "spears, crosses, and swords," the needle-shaped crystals attaching themselves to the film either singly or with several crossed together, and hindering the action of the light.

Our attention was lately directed once more to this point by a letter from Herr Krüger, of Schwerin. He sent two samples of crystals which had precipitated themselves in his silver bath, and wrote that he had been annoyed the whole summer by pinholes, which often appeared after two days' use of a new silver bath, even when it contained little iodide of silver. The crystals in question had attached themselves on the evaporation of one of the baths.

I examined the crystals, and found, besides iron and a splinters of glass, a considerable quantity of sulphate of silver.* This result surprised me, as I did not at once suspect the source of this impurity. A second letter from Herr Krüger gave the necessary explanation, informing me that in the examination of the spoiled baths he had likewise discovered sulphuric acid, and that this arose from the impure iodizers which he had applied. At the same time he sent me the iodizers mentioned, and the impure bath, and there I found indeed sulphuric acid along with carbonic acid (in the iodizer).

The source of the sulphuric acid in the bath was now discovered. A part had got in the bath at first by iodizing it with a little iodide of potassium. Every new collodion plate had increased the quantity of it, and the most probable supposition was, that the salt, with its known difficulty of solution, had rapidly precipitated itself, and occasioned the pinholes.

In order to test whether the sulphate of silver really occasioned pinholes, I made a silver bath 1:10, and mixed this with $\frac{1}{4}$ per cent. of iodide of potassium, and tested it. There were no pinholes.

To 200 cubic centimetres of the bath were now added 0.8 grains of sulphate of soda. A considerable precipitate of sulphate of silver was formed. This was filtered, and in the filtered bath a plate was made. On sensitizing, it appeared covered with small crystals, and after being exposed to the light and developed, it swarmed with little pinholes.

Here, however, a considerable quantity of silver (about 4 per cent.) had been precipitated as sulphate, and there was reason to suspect that thereby the power of solution for iodide of silver might have been lessened, and thus the pinholes caused. I therefore repeated the experiment, taking 200 cubic centimetres of a new freshly iodized bath, and shaking it with fixed sulphate of silver. Here the quantity of nitrate of silver remained the same.

Only very little sulphate of silver was dissolved, and I obtained a bath which contained of sulphuric acid much less than that of Krüger, and also gave but few pinholes. During the night, however, the bath cooled considerably, and next morning it gave numerous pinholes.

The cause, however might still be laid on the iodide of silver which was present. I therefore made a third bath without iodide of silver—

Water	...	...	...	200 cub. cents.
Nitrate of silver	...	...	...	2C grains
Sulphate of soda	...	...	...	0.5 grain

A precipitate of sulphate of silver was thereby formed. The whole was now heated to 90° C. Notwithstanding this, the precipitate dissolved with extreme slowness, and even after an hour-and-a-half there was still a small residuum—a proof that 100 cubic cent. of a silver bath, 1:10 at 90° C., is hardly capable of dissolving $\frac{1}{4}$ grain of sulphate of silver. A further addition of 0.5 grain of

* Mr. Mayall recently mentioned to us that, as the result of the examination of an old and imperfect bath, sulphate of silver was found in it.—ED.

sulphate of soda was made, the evaporated water replaced, the whole filtered, and allowed to cool for twelve hours. Small crystals had then secreted themselves on the surface. Several prints made in this bath showed very numerous pinholes. Now this bath was free from iodide of silver, apart from the small quantity which is dissolved in sensitizing; the pinholes accordingly could not proceed from it. It is therefore established beyond all doubt that pinholes are occasioned by sulphate of silver.

I observed, moreover, in the case of this bath, another remarkable phenomenon, viz., clear, worm-shaped lines. These lines remind me strongly of an incident which occurred in the Photographic Association. Herr Benque exhibited at the session of the 17th of March several prints, upon which quite similar lines were visible. Nobody was able at that time to give a satisfactory explanation of the phenomenon: Herr Schippang and Herr Prumm ascribed it to the iodizers.

I believe that I can now, with tolerable certainty, assign as the cause of these strange phenomena the presence of sulphate of silver, and it may be that this has been produced by the impure iodizers. The matter induced me to examine several of the commercial samples of iodizers, and I readily found in these sulphuric acid and carbonic acid.

There are, besides, other sources of sulphuric acid in photographic baths. It may proceed (2) from impure nitric acid, which was employed in the dissolving of the silver (as Herr Krüger has already asserted); (3) from acid pyroxyline; and (4) from impure blotting paper. The latter not seldom contains sulphate of lime, and also sulphate of soda, as a residuum from the bleaching process with antichlor.

It is obvious, therefore, that the presence of sulphuric acid in photographic chemicals is much more frequent than one would suppose, and it appears to me highly probable that the formation of pinholes in cold weather (as observed by Herr Kurths and Dr. Lorent) proceeds from it.

These experiences may induce manufacturers to direct their attention to this, hitherto entirely overlooked, the presence of sulphuric acid in photographic chemicals; and we advise photographers to test their chemicals themselves for it.

This is best done with the aid of nitrate of baryta, which is to be added to a solution of the substance to be tested, acidified with a few drops of nitric acid. The presence of sulphuric acid betrays itself by producing a turbidity. To test, in this way, silver baths containing iodide of silver in order to detect sulphuric acid, requires caution, since iodide of silver precipitates itself, and likewise occasions turbidity; two or three drops of nitric acid should be added to four cubic cents. of bath solution, in order to prevent the precipitation of iodide of silver, and not till then a few drops (as few as possible) of nitrate of baryta solution. The turbidity does not show itself for some time. It is better, however, to precipitate the silver with pure hydrochloric acid, to filter, and then to test for sulphuric acid.

Now I tried, by mixing with nitrate of baryta, to precipitate the sulphuric acid in the negative baths which contained the latter, and which produced pinholes. In connection with this, I made a remarkable observation.

I added 0.8 solid nitrate of baryta to the first bath (200 cub. cents.), shook it, and let it stand till the next day; then filtered off the sulphate of baryta which had been produced, and made a print in the bath. This showed now no pinholes, but an *astonishing intensity* immediately after development, so that it could be printed immediately without any strengthening. The plate appeared only a little hard.

The bath contained, as I establish by examination, a little barium.

The second bath, containing sulphuric acid* (it contained

0.25 per cent. sulphate of silver), was now mixed with $\frac{1}{2}$ per cent. nitrate of baryta, and treated just as above.

The result was the same. I obtained a plate of *extraordinary intensity*, somewhat hard in the lights, but with many fine details in the shades (of the original), finer than with an ordinary bath. The intensity of the plates made in the second bath surpassed that of those made in the first (which also contained less barium).

I must conclude from these experiments, several times repeated, that nitrate of baryta in the negative bath increases remarkably the intensity of the plates.

It should only be added, however, in a very small proportion to the silver bath, for it belongs to the salts which are difficult of solution in water, and which are precipitated in crystals by alcohol.

If a bath, therefore, contains much barium, the latter is precipitated by the alcohol of the collodion film, and occasions, like all precipitates of that kind, *pinholes*. With longer use of a bath containing much barium, these pinholes would appear to a remarkable extent.

APHORISMS FOR PHOTOGRAPHERS.

BY FRITZ HAUGK.*

1. *Caution in Washing Prints.*—If silver prints are washed in very cold water in a warm room, numerous little air-bubbles affix themselves to the print. These remain often very obstinately upon the photographs, and stand in the way of the picture being freed from hyposulphite of soda. It is advantageous, therefore, to wash prints in boiled water that has cooled, or to keep the prints so much in motion that the air-bubbles are destroyed.

2. *Stoppers for Varnish Bottles.*—Varnish bottles are best closed with stoppers formed of good and pure wax, or corks may be used which have previously been dipped in molten wax. If corks are employed with no wax coating, they very often stick fast in the bottles, and particles are often removed which render the varnish impure.

3. *The Production of Special Bust Pictures.*—The vignette masks have nearly all of them a pear-shaped outline, and in printing, the broad part of the opening is laid upon the breast of the portrait. In this way the picture is printed. A more beautiful effect is secured, however, when the vignette mask, after the print is about three-quarters finished, is turned round, and the broad part of the opening is put uppermost. In the case of ladies with very large head-dresses this method of printing has especial advantages.

4. *Retouching Powder.*—This powder is prepared by mixing together—

Dextrine	...	...	...	...	2 parts
Resin, very finely powdered	...	...	...	...	1 part.

It may be employed both for application to negatives and to albumenized prints. A leather stump is the best means of application.

5. *Net-like Cracking of the Film.*—In employing a collodion prepared with alcohol of too weak a nature, the film is apt to tear, as soon as it becomes dry, in a net-like form. If these cracks occur only in places, the collodion may readily be freed from the defect. It is only necessary to add to it an equal quantity of another collodion, in the preparation of which absolute alcohol has been employed. Another way, also, of helping oneself is by collodionizing the plate more quickly, and not permitting it to dry so perfectly. In the case of strongly iodized collodion, another error may, however, arise, which is known by the name of iodine streaks or flames. But this fault, unless it is very rampant, is only to be seen on the top of the image. In this case the plate should be turned round on the dipper before being put into the dark slide, and redipped, the plate being raised and lowered half a dozen times.

* *Photographisches Archiv.*

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DRYING CARBON TISSUE.

ONE of the practical obstacles to success which trouble many carbon workers is the difficulty of drying the tissue after sensitizing. The greediness of gelatine for water readily explains its slow drying tendency, and the readiness with which gelatine saturated with water melts on the application of heat explains the danger of applying a high temperature to get rid of the water. No aid to drying the sensitized tissue has been found so efficient as a current of warm dry air. But as the tissue must be kept in the dark, this mode of drying is not always easy of application. Very slow drying, besides being inconvenient and obstructive of the despatch of business, has been found to promote spontaneous insolubility in the tissue. Very rapid drying has been said to cause reticulation in the texture of the prints; but this, as we shall show, is not a necessary or universal concomitant of quick drying, even when effected by the aid of heat; whilst the use of alcohol, and such aids to desiccation, have been found preventive of reticulation.

A mode of applying heat for quickly drying the tissue has recently been brought under our attention by Mr. Mayland, who finds it possible to have the tissue exposed under the negative in the pressure frame within an hour of commencing to sensitize the tissue. It is dried in a drying box a few feet square, at the bottom of which is a sheet of tin, immediately under which is an Argand gas burner. On the tin is a shelf of wood. The sheets of tissue, after sensitizing, are treated with the squeegee to remove all surface water, and then hung up in this drying box. A sliding door, sliding upwards to open, is left open at the bottom about an inch, and through the narrow aperture thus left open the air enters freely, causing a current in the box. This is aided by the fact that the sliding door fits loosely in its grooves, and at the top, leaving space for the exit of the heated air. The result is that the tissue dries in about thirty minutes, and Mr. Mayland has not found the gelatine to melt or run in any instance. The temperature of the atmosphere of the box whilst drying the tissue is from 100° to 130° Fahrenheit. During the late discussion on carbon printing at the Photographic Society, Mr. Sawyer mentioned very rapid drying as having been found at the Autotype works a specific means of securing reticulation. Mr. Mayland's drying process is much more rapid than that mentioned by Mr. Sawyer, and he (Mr. Mayland) has never in a single instance found a trace of reticulation. It is probable that in the instances observed at the Autotype Works some other agency had been at work concomitant with the quick drying, and to such agency the reticulation had been due.

The method described in our pages a few weeks ago, by Mr. Charles Waldack, as employed by M. Gernez, a

highly experienced carbon printer, for securing quick drying, seems to be very promising. After removing from the sensitive tissue excess of solution by means of the squeegee, he places the tissue in alcohol. As many of our readers know, alcohol is even more greedy of water than gelatine is, and during a short immersion the water is withdrawn from the tissue by the alcohol, and the issue is that after this treatment, and hanging for about half-an-hour, the tissue is ready for the pressure frame. The alcohol may be used for a few times, but of course, as it absorbs water each time, it gradually loses its efficiency, and will require re-distillation. As methylated alcohol will serve every purpose, this need not be found a very expensive expedient, as it will be specially beneficial in hot weather.

It has been proposed to use alcohol in the sensitizing bath as a ready means of meeting the trouble in drying. But the fact that bichromate of potash is entirely insoluble in alcohol places a serious difficulty in the way. M. Vidal has found, however, that the addition of a portion of alcohol is possible with good effect, and M. Boivin states that a sensitizing bath made as follows answers perfectly, and that the tissue dries readily—

Water	70 cub. cents.
Alcohol	30 "
Bichromate of ammonia	3 grammes
Ammonia, from	1 to 3 drops

This would give a bath containing three ounces of alcohol for seven ounces of water, and about eighteen grains of bichromate of ammonia and a drop or two of liquid ammonia for each ounce of water.

So far we have been dealing with what has been actually done, and, as is alleged, with beneficial effect. But this is a very promising and fascinating direction for experiment, and it may be well to indicate some possibilities for the aid of experimental readers, and also for practical carbon workers, to whom this drying question is one of vital importance.

It is to be remembered, at the outset of experiments in this direction, as was ascertained in the early experiments of Mr. Swan and others, that chromic acid is the actual sensitizing agent, although it has been found convenient in practical operations to use an alkaline chromate. Whilst these chromates are, however, insoluble in alcohol, chromic acid itself is soluble in alcohol, and also in ether. It is probable that an alcoholic solution of chromic acid might be found available for sensitizing the tissue, when all difficulty in drying would be at an end. Or, probably, better still, would be found the tetrachromate of potash, which is soluble both in alcohol and in water, or in a mixture of the two, and this would, we have no doubt, be found in every way available for sensitizing the carbon tissue, without any risk of solution or running of the gelatine in warm weather, and present no difficulty in securing rapid drying. The chief practical difficulty to be anticipated in applying either of these preparations would consist in the fact that an alcoholic solution of chromic acid, or of tetrachromate of potash, is readily liable to spontaneous decomposition if submitted to the action of light, or to a high temperature; but no serious difficulty need exist in avoiding these conditions of failure. We commend the experiment to the many ingenious carbon workers whom the question concerns, and shall be glad to learn the results of experiment.

A NEW METHOD OF ARTIFICIAL LIGHTING FOR PORTRAITURE.

MR. VANDERWEYDE has called our attention to a distinctly new and very bold attempt to apply artificial light to the purposes of portraiture, which promises a large amount of success. From the earliest days of photography the possibility of applying artificial light to purposes of portraiture has been the subject of much speculation and

experiment. Many attempts have been made with various forms of light and appliance. Pyrotechnic compounds of various kinds, yielding a light rich in photogenic rays, have been tried, and, so far as the mere obtaining of a light sufficiently actinic to impress a photographic sensitive surface goes, not without success. The lime light, the magnesium, and the electric lights have all been tried, each with a measure of success. The primary difficulty has been in applying any of these lights so as to secure satisfactory illumination of the model, and to obtain artistic light and shade in the resulting picture. The conditions of an artificial light consisting of a point or concentrated source, are opposed to the conditions of ordinary portraiture, in which parallel solar rays are, of course, always used. In a picture it is necessary to a satisfactory and natural presentment that the objects should be lighted as they are usually seen in nature, and this is not secured where an intense concentrated light is the source of illumination. And the usual results produced by the use of such lights has been at once unnatural and unpicturesque. The lights have been harsh, chalky, and without gradation or detail, and the shadows black, dull, and without the transparency due to reflected lights by which the deepest shadows are relieved in ordinary daylight illumination. Reflectors of various kinds have been used to overcome these difficulties, and at times with some degree of beneficial effect, but not with sufficient advantage to bring them into practical operation.

It is obvious that in a country where not only are so many of the hours devoted to active life, sunlight is absent; but also where during the hours of daylight, so many of them are characterized by fog and other atmospheric conditions rendering photographic operations next to impossible, that any method rendering the portraitist independent of either bright sunlight or ordinary daylight, must be regarded as a great boon worthy of all consideration and acceptance. And any method which promises in a practical way to effect this must be hailed with a glad welcome by all photographers. Hence we feel especial interest in bringing the new method under the attention of our readers.

From the commencement of Mr. Vanderweyde's connection with photography as an artist he has felt that the lighting of the model was the operation of primary importance in securing successful results, and he has devoted much study to the various methods employed. The mode of lighting the studio with which his name is associated was one outcome of this study, and the present method of applying artificial light to illuminating the model is another result. After trying various artificial lights he has satisfied himself that there is none so actinic and so constant as the electric light, but, being emitted from a point, none more inapplicable to the purposes of portraiture. But it is to obviate the difficulties dependant upon the concentrated character of the light that the new system is devised. The light having been prepared by one of the various methods available—we may mention, in passing, that Mr. Vanderweyde is using a Gramme machine, gaining his power by a gas engine—a concave reflector is placed at a suitable distance behind it. At a suitable distance in front of this is placed a large lens of forty inches diameter. The lens used by Mr. Vanderweyde is one of Fresnel's dioptric lenses used in lighthouse illumination.

By this lens the rays from the concave reflector are collected and brought into a cone—not, indeed, coming to a sharp focus, as they would be by a lens of perfect optical qualities. At the focus of this lens, at which a disk rather than a point of light is produced, the sitter is placed, where he is bathed in an intense, but still soft flood of light, having the appearance and quality of concentrated daylight, or the direct light emitted from a very bright white cloud, which, as photographers know, is one of the most pleasant and efficient sources of illumination. The time of sitting, as will be understood, may be controlled by

the intensity of the light employed. In the excellent examples of portraiture produced in Mr. Vanderweyde's experimental operations the sittings generally averaged thirty seconds or under.

As we said at the outset, the project of applying artificial light in this manner is as bold as it is original, and, judging by results, we may fairly add, as successful as either. We need not dwell on the multiplicity of applications possible, as they will readily occur to the minds of photographers. We are unable at present to state in what manner the project will be made available to photographers. The method is patented, and a Company, entitled the Photogenic Company, Limited, is formed to work it. We shall keep our readers duly informed of further progress.

PHOTOGRAPHIC EXHIBITION IN AMSTERDAM.
We recently announced details of the forthcoming Photographic Exhibition in Amsterdam, and gave a list of the medals offered for excellence of various kinds. We are now authorized to announce a further medal. The Photographic Society at Amsterdam has resolved to give a silver medal for the best photographic ceramics, and photographs on stained glass. We hope that many competitors in this country will send contributions to this International Exhibition, which is undertaken with so much spirit and liberality by our photographic friends in Holland.

THE PHYSIOLOGICAL ACTION OF LIGHT.

Some curious experiments undertaken by Professor James Dewar, M.A., although appertaining more to the province of the physiologist than to photography, deserve to be mentioned, on account of their contribution to the science of light. Mr. Dewar has for some time past been engaged in noting the influence of light upon the eye and animal system, and has employed the electric current to register the variations set up by light of different intensity.

It may be mentioned, in parenthesis, that Mr. Dewar's experiments were conducted with animals in a state of stupor, except in one particular instance, when he operated upon a human animal—presumably himself. A current of electricity was made to pass along a wire and through a galvanometer to register its intensity, and then one pole was placed in contact with the cornea of the eye, and another either in contact with the brain or the cranium. Light was then permitted to shine upon the eye, and as the amount of light was increased, or lessened, a corresponding change in the electric current was observed upon the galvanometer needle.

The variation, it seems, is the same in warm as in cold-blooded animals. Light causes a *positive* variation of the needle, it is found, and an increase in the electric current. As soon as light is admitted to the eye, the movement of the needle is very marked; "in the case of the lobster," says Mr. Dewar, "the variation caused by the impact is greater than what we have noticed in any other animal, often amounting to one-tenth of the total amount of current." Another point worthy of record is that "light falling on the one eye causes the needle to move, say to the left, while, if it fall on the other eye, the needle swerves to the right."

These experiments of Mr. Dewar's prove how intimately light and electricity are connected with one another.

TRANSATLANTIC WRINKLES.

BY LAFAYETTE HARRISON.

No. II.

SOME few months ago an editor of a New York daily perpetrated a disgraceful newspaper joke. He caused an alarming account to be published of a mythical escape of

the wild animals in Central Park, stating that they were still at large, and detailing frightful scenes of carnage in a most vivid and natural manner. It was a bright afternoon, and hundreds of children had been sent to play in the park. The effect of the announcement was terrific—the whole city was panic-stricken. No one read the article through, but just rushed off to the supposed scene of blood. Had they done so they would have seen at the end that "The moral is, it is a huge hoax."

The readers of this journal must have themselves appended a similar moral to my last paper in the *News* (p. 115), where, in clean out type, they were frantically besought to flow their negative plates with a solution of water and the yolk of an egg. Probably not a few added, "That tarnation American is getting at us."

I assure you that I never laughed more heartily in my life than when I read the error. I felt that it was too absurd to mislead any professional artist, but I could not help picturing the tyro, fancying that as Howe discovered the eye of the needle to have been in the wrong end, so he had been using the wrong part of the egg, and, struck with the brilliancy of the idea, I could see him soberly coating a plate with a diluted chicken-in-embryo, and I must admit that I laughed until the tears came. Probably it is the best photographic joke ever made. The dream of my life is realized—I shall be immortalized.

If, however, it has really misled any one, I shall regret it. At the same time, I warn each enraged amateur that I have had the ("chronic") sentence "Back in an hour" painted on my office door, that my landlady is provided with a Colt's revolver, and that there is a dog in a perennial state of hideous madness on the premises, so that I wouldn't advise him to seek redress. Sub-rosa: At the urgent request of anxious friends, I quit, this night, for Yokohama. My witty countryman, Max Adeler, tells of a compositor whom he styles "intelligent," who, for the poetic line,—

"He watched the window till all hope had vanished,"

substituted,

"He washed the window sill with soap and varnish."

As if matters were not bad enough already, the compositor represented me as saying—"nitric acid and water, in which place overnight the prints," instead of *plates*. Altogether the joke may be termed unique. Need I say that in both cases where the word *yolk* is used, read *white*? Send the yolks to the kitchen, unless you keep cyanide of potassium lying around loose. In the latter case throw it over your neighbour's wall—if he keeps a cat which annoys you. As Toole would say, "Give the animal a treat." With this amendment, try albumenizing. Your films will never crack or peel.

A word to you plate-polishers. If you notice a film beginning to peel, flow it with ale. If it is still more serious, and, besides peeling, requires more intensifying, use porter, which will serve the two-fold purpose of saving the film and adding density.

At the end of the summer every photographer who does any business regards with melancholy a big heap of rejected varnished negatives. If he attempts to clean them, he knows by experience the labour required, and the dustmen refuse to have them at a gift. What is he to do, therefore? To which conundrum I answer:—Procure at the oilman's one pound potash-ball (otherwise called concentrated lye); break it into small pieces, and dissolve it in four gallons of hot water. Place the discarded negatives therein, and in about half an hour, more or less, according to the hardness of the varnish, the film will easily scrub off. This amount of lye water will clean almost any number of plates. Next put the glass in your nitric acid solution, or, better still, in Lea's bichromate solution, the formulae of which I will subjoin for the benefit of those who are ignorant of it:—

Bichromate of potash	...	...	2 ounces
Sulphuric acid	...	...	2 ounces (fluid)
Water	...	...	25 "

(N.B.—This bath is good as long as it is of a yellowish brown colour; when purple it ceases to act).

Let the glass soak in this for a couple of days, and then albumenize as with new glass, and you will get good results. No stains or ghost of the former image. As the lye solution is pretty strong, it may be a Samaritan act to warn you not to dip your fingers therein, unless you wish, like the Ethiopian, to "change your skin."

To remove unvarnished films which have dried, dip a damp sponge or flannel rag into some coarse salt, and rub the film off with this; the most stubborn will quickly disappear. Then soak the plate as usual in the nitric acid, or whatever glass cleaning solution you use.

There is, undoubtedly, a degree of finish in American photographic productions seldom if ever to be seen in those of this country. It will be my endeavour in a future paper to point out wherein the differences lie, and attempt to give a few "wrinkles" which shall enable any true artist, anywhere, to turn out equally effective work; but at this present I shall merely touch upon that which is most apparent, viz., the burnish or glossy surface.

Burnishers seem to be out of favour in this country. Photographers who possess them do not use them (or at least this is the case with very many), and those who would otherwise be purchasers hold back because of the evil reports of the "goings on" of the said machines. The reports, so far as I have been able to learn, are that it both blisters and scratches the prints, therefore it is put aside to rust, or sold at a bargain to the first buyer. If anyone were to show these burnisher-possessors how this might easily be overcome, I take it that he would be performing a good service. I venture so to do, but do not expect to get thanked for it, because of its simplicity. I owned as a boy one of those paper-cover, dime books on "Magic," in which a story was told of a gentleman at an inn being considerably mystified by a countryman who caused a silver half-dollar to vanish. Again and again the trick was performed, and the gentleman felt himself so baffled that he said (I quote the book from memory), "This is most wonderful, and can only be accomplished by the most complicated of means." Then, calling the man, he said, "Show me how the trick is done, and this five-dollar bill shall be yours." The man complied. It all proved to be simple sleight-of-hand. At which discovery I remember the gentleman was highly indignant. Moral:—He wanted more for his money.

Nevertheless, you shall learn how to set your burnishers going, and keep them in order. If they scratch now, polish the nickel plate with a jeweller's hone (price one shilling). Take a sheet of unglazed note-paper folded, as usual, in half. Turn down the top about half-an-inch; turn this fold down twice more (as if you were making a paper spill, the short instead of the long way of the sheet). Then fold the paper in half, so that what was at first the bottom of the sheet comes flush with the rolled or folded part. This, you will see, makes a kind of wedge. Pass this through the burnisher a number of times before commencing, and once before burnishing each card. The object attained is this—it passes smoothly through the burnisher until the thicker or rolled part of the paper, which gives it a brisk wipe the whole length, removes all grit and dust, and the cards come out clean, and with a bright polish.

If the cards do not slip well, make a lubricator of two grains of Castile soap, scraped very fine, and dissolved in six ounces of alcohol. Apply this lightly to the face of each card—shortly before beginning to burnish—with a tuft of cotton wool.

Don't use too much pressure in burnishing—half that of rolling; and so long as you do not over-heat the plate, your prints will never blister.

CARBON PRINTING.

BY A. WELLESLEY TURNER.*

Development.—The flat zinc dish being previously filled with water at a temperature of about 80° or 90° Fahr., the first plate of prints squeezed is placed therein, and left till the gelatine is seen dissolving round the edges; the tissue is then carefully stripped from the plate, which is next placed in the vertical dish, also filled with water of a similar temperature to the first; each plate is treated in this manner, and by the time the operation is completed we shall find that upon drawing the first one out of the dish, it will probably be nearly developed—that is, most of the soluble gelatine will have run off the plate, and left the image visible; the flat dish is again filled with fresh warm water of a higher temperature, if thought necessary, and the prints are thoroughly washed till they appear in all their beauty and perfect sharpness. By this means the development goes on to a great extent without any trouble, and supposing the prints have been properly exposed, as each plate is taken out in succession it will be found nearly finished; should they, however, be a little dark, they must be treated to much warmer water in the flat dish, or, what is more convenient, they can be left for longer immersion in the vertical dish. There is one great advantage in this method of development—we can see very readily how the prints have been exposed. If they are under-printed, we have the consolation that we could not have saved them by other treatment, as they are first developed at a low temperature as practically possible; but should they, on the other hand, be over-printed, we have only to return them to the warm water, and let them soak till they have come down to the proper depth. I have found they will do so much more by leaving them a long time in a vertical dish of water about 100° than by raising the temperature much higher and washing in a flat dish. All the prints properly exposed I wash in warm water, and finish immediately, but return the others to the vertical grooved dish. If only slightly over-printed, half-an-hour's immersion may be sufficient to bring them down, but in some cases they may be left for hours. It is surprising the control we have over the printing by this means. I have had, on one or two occasions, several plates of prints that were hopelessly over-printed if treated by any other method but by leaving them all night immersed in water that in the first instance was not much over 100°. I have by the next morning found them brought down to the proper depth. I would not, however, advise too great a reliance being placed on this in printing, but I would strongly impress the importance of proper exposure. I merely mention it to show the great control we have over the printing in the development, and to prove that the process is not of that exacting character some imagine, as well as the fact that it will be found useful in many cases to the practical worker.

When properly developed, they must be well washed in clean cold water; this finally washes off any remaining dirt, and sets the gelatine, which is afterward further hardened by pouring a solution of alum over them and leaving it on a few minutes, or by putting each plate of prints in a flat dish, for a short time, filled with the same. It is important that this branch should not be done carelessly, as on it depends, to a great extent, the durability of the high gloss if they are required so. When thoroughly hardened with alum, the prints are less liable to absorb moisture from the atmosphere, and thereby lose the beauty of their surface to a great degree.

Each plate of prints is next returned to the rack and dried spontaneously, or, if required, can be dried with a gentle artificial heat; but I prefer the former method. When dry, the prints are spotted in the same manner as enamelled silver prints. There are many ways of doing this, all, I am afraid, open to some objection. I

always use oil colours applied with a small sable pencil. Sometimes the carbon tissue dissolves in warm water is used; but as this is not essentially part of the printing, I will, on this occasion, now pass on to the

Application of the Transfer Paper.—With this branch the beginner can hardly fail; the plan of doing it is so obvious and simple that I need not occupy much space in describing it. The transfer paper is cut about a quarter-inch smaller than the plate all round, and placed in warm water of about 70 or 80° Fahr., where it is left till thoroughly soft, and the surface feels slimy when touched with the fingers. Some samples require much longer soaking than others, and I have had some that refused to get properly soft with almost any amount of soaking. This description of paper is liable to show light brilliant spots on the prints when transferred, in consequence of its not properly adhering to the film composing the image in those parts; such paper, I need hardly say, is not good, but it may be reserved by large work. The transfer paper, when in condition, is carefully raised from the warm water by the two opposite corners, and lowered upon the plate of prints previously placed on the flat board, and gently but well squeezed.

Mounting, at which stage we have at last arrived, cannot be commenced till the transfer paper is somewhat surface-dry, or entirely so, that is if the prints are required with high gloss, of which class I will first speak. They are then marked at the two top corners and each side with blacklead pencil by holding them up and seeing the position of the print by transmitted light; but this can only be done when they have been tinted to the extreme edge, forming, as it does, a guide for placing the mount, which is then damped on one side with a sponge; the transfer paper in that part covering each print is covered with strong size or Russian glue and sugar; the damped mount is adjusted in position by placing it exactly up to the top marks, and bringing it carefully down the side ones; do not, if possible, raise the mount after it has once been laid down, as by doing so the mounts often refuse to afterwards stay flat or properly adhere to the transfer paper. They are next put under slight pressure to allow the size to set, and I then stood up in a warm room to dry. Twelve hours should be allowed for this purpose, for if stripped sooner the dampness from the transfer paper or size may still be retained, and will work its way through, ultimately destroying the high gloss of the surface, although it may not appear immediately. *Never hurry the drying* in this branch, as they are always better when dried slowly than quickly; the less rapid the drying the flatter the print will be, and finer the surface.

When dry strip from the plate, and trim. For mounting with high gloss, without the tinted edge, it is only necessary, when the transfer paper is sufficiently dry, to place over the whole with size or strong paste a very thin sheet of card, or one or two thicknesses of transfer paper; dry, and strip from the plate; trim them in a similar manner to ordinary silver prints; next apply with a small brush, round the four edges of the card, a strong solution of Russian glue or other similar body, and place them in position on the mount; cause perfect adhesion by gentle pressure; the thin card in this instance is only used to keep the prints flat, and to prevent moisture of the glue from destroying the surface.

Another very good plan of mounting is to strip the prints from the plate when the transfer paper is dry, trim with the ordinary card or cabinet outer, damp and mount in the same way as you would a silver print; by this means we lose the high gloss, and obtain one less brilliant, but it is easier done, and some prefer the appearance of the resulting picture; for this purpose we can use a tinted, plain white, or no border at all, according to taste or convenience.

In concluding my remarks upon this subject, which I trust may be of service to some, at least, of my readers, I have only to add, that I have given without reserve what-

* Continued from page 134.

over I have thought may be useful to the profession. Others, in working the process, may find a lack of information on some points, and I would advise all who can to see the operations for themselves; this will teach far more than all I can write, for we often omit in written instructions what is very important to the successful working of a process, merely from the fact that familiarity with certain operations makes us think so little of them that when we sit down to write they slip our memory. I can only say that however much I may have omitted, I have not stated anything but what I know will practically aid in making it a successful operation. I do not claim any part of what I have written as essentially new; I have only put together most of what has been previously published in this journal, and so formed a chain of it with my own experience, in hopes of bringing the process more prominently before my readers, and rendering it useful to them.

Correspondence

MR. FOX TALBOT AND BICHROMATE PROCESSES.

DEAR SIR,—Three years ago, when lecturing at the Royal Institution, I intended to make use of a letter I had received a day or two before from Mr. Fox Talbot, but I had only time to refer to it in the very slightest way. I had, however, in my lecture last week an opportunity to read two or three passages from it, and I was struck with their historical interest, an interest which I believe to be sufficiently great to justify me sending you the following copy:—

“4, Circus, Bath, Feb. 15th, 1874

“Dear Sir,—I will send you to-morrow three specimens of my engraving. This art was discovered in 1852, and published in 1853. The great difficulty at first was to obtain the semi-tints. It was found easy to copy letter-press engravings, or anything merely black and white; but graduated shading offered a difficulty.

“The main fact upon which the art reposes is the photographic quality of bichromate of potash when mixed with gelatine, discovered by me in 1852, concerning which, as it was a great step in photography, allow me to say a few words.

“Mr. Ponton discovered in 1839 that paper became sensitive to light when washed with a solution of this bichromate. No use was made of this knowledge for thirteen years, when, in 1852, I attempted to engrave, and after various other things had been tried, with results more curious than useful, I thought of trying the bichromate mixed with gelatine, which proved successful. I had rather anticipated a failure, because many other photographic substances will not unite with gelatine, but cause it to curdle. I have always considered this process to be one of the most useful things I have done in photography. I sent a great many specimens to Monsieur Biot, which were given away by him at a meeting of the French Academy of Sciences in April 1853. Several writers on photography have fallen into error, and attributed the discovery to a Frenchman, who published it anew, I believe, two or three years later.—Believe me, yours very truly,
H. FOX TALBOT.”

It is certainly interesting that Mr. Fox Talbot, who holds the rank of pioneer of the photographic processes in this country, should have discovered the process upon which is based nearly the whole of the present methods of permanent printing.—I am, dear sir, yours very truly,
43, Piccadilly, February 28th.
VERNON HAZEL.

[It is very interesting to note the fact that Mr. Fox Talbot, the actual inventor of silver printing and of the negative process, was the first to give a practical application to Mr. Mungo Ponton's discovery of the photographic properties of the chrome salts. It would not be fair, however, to overlook the fact that Mons. Becquerel had pre-

viously taken up Mr. Ponton's process, and ascertained that the action of light in this method rendered insoluble the gelatine or other sizing matter in the paper sensitised by a salt of chromic acid, and that M. Poitevin was the first who actually employed these reactions in carbon printing.—Ed.]

A CONVENIENT PIPETTE OR DROPPING BOTTLE.

SIR,—I beg to enclose to you, for the benefit of the readers of the News, a little instrument I have found of great service, which has saved a deal of time, and I have no doubt saved a great quantity of silver solution from being wasted. The purpose for which I use it is this: I use it to measure correctly the silver solution when intensifying the negative. As you are aware, in many studios it is done by dropping some of the bath solution off the dipper, or, where there is a special solution kept, it is generally dropped from the bottle; in either way, there can be no certainty as to the amount dropped. I have no doubt many negatives that would have been very good ones have been spoiled by these methods of working. The instrument consists of a piece of glass tube about the thickness of a goose quill, any length to suit; it is drawn to a very fine point, either by the flame of a spirit lamp or gas, and then a very fine hole is made at the point. Now procure an india-rubber test, such as chemists sell for infants' feeding-bottles. Choose one without a hole in it, if you can; if not, just cover the hole up by applying a coat or two of strong india-rubber varnish. Now introduce the wide end of the glass tube just into the test, and tie the test on to the glass tube tightly, then varnish the thread or string with a little shellac varnish. Now the instrument is complete, and forms a very fine drop syringe. To use it, keep your silver solution in a bottle according to the length of the drop tube described above. Place the tube in the solution (I always keep mine in it), press all the air out of the bulb formed by the test, then allow it to fill by taking the pressure gradually off, when it will fill the tube with the solution, which will not drop out until some pressure is used with the bulb, when it will drop, and may easily be counted; so that any person using it can regulate the quantity of silver solution to a nicety. Hoping it will be found useful by some of your readers, and apologising for trespassing upon your space, I am, sir, yours &c., S. V.

[The pipette enclosed is very handy and useful. Something of the kind has been before described; but this possesses a special advantage in simplicity of manufacture and efficiency.—Ed.]

COLOUR OF CARBON PRINTS.

DEAR SIR,—“A Carbon Worker” is evidently unhappy—evidently a man with a grievance, and the way in which he airs it is neither edifying nor amusing. He is hurt and indignant at “a curious and monstrous kind of monopoly”—at the arrogant claims of the Lambert licensees to “the exclusive right to the best information”—at their “being chary of communicating information,” and many other things.

Why, these people have actually got a special journal, and “Carbon Worker” is not allowed to peep into its pages; and the Autotype Company—he is astonished beyond measure that they should “lend themselves to such short-sighted narrowness.”

This is all very pretty, no doubt; but let us see what it all amounts to. The Lambert-type licensees have made certain payments which entitle them to certain privileges—special times, special materials, special information from the Autotype Company, special instruction—and they receive monthly, as a private communication, a journal containing whatever is new or interesting relative to the process of chromotype printing; in addition, they are entitled to a pecuniary benefit in a reduction in price of all tissue they purchase.

Can "Carbon Worker" show cause why he should participate in these advantages? Has he paid his fee, and not received his *quid pro quo*? or does he decline to pay his money, and still expect these advantages? "Carbon Worker" does not like Lambert purple, "the colour is not good in any sense." Well, perhaps not; the fox said the grapes were sour when he could not reach them; but he knows perfectly well that the very colours that he names as good are open to him; *de gustibus non est disputandum*, he need not attempt to set up his dictum as a standard of good taste.

"Carbon Worker" could hardly be a worker and not know that the Company have for years supplied (to anybody who chose to purchase) two tints, which correspond so closely to his description, that one might have supposed he was actually quoting the Company's price list. He mentions a "rich brown" and a "rich warm black;" the price list gives one colour as "producing a rich brown tone," another as "a rich black, slightly warm in colour." Wherefore this feigning of ignorance?

And now one word as to Lambert's licensees being chary of giving information. It would not be difficult to show that most of the articles that have appeared in the journals lately have been written by disciples of Lambert. Strangely enough, one of the very men "Carbon Worker" thanks (Mr. Witcomb) is a Lambertian man—no one will deny the value of his many contributions. Mr. Braybrooke, whose paper was read before the West Riding of Yorkshire Photographic Society, is the chief of the staff at Mr. Sach's establishment at Bradford and one of the most successful chromotype workers in England, or out of it. If Mr. Wellesley Turner is not a licensee, he certainly seems to know as much about the matter upon which he treats as if he were one. Upon what ground does "Carbon Worker" rest his charge of "petty exclusiveness" and illiberality?

For the future let "Carbon Worker" so marshal his arguments with temper and moderation, so put forth his facts as to be in accordance with the truth; then shall he obtain the sympathy and approval of your readers, and avoid the reproaches of

NEWSMAN.

MEDALS NOT WON.

DEAR SIR,—Your correspondent "Ton Don" should take a run down to Brighton to see a very novel use of medals. The honest photographers of this town, whose "withers are unwrung," will not win at the following remarks, namely, that there is one among us who has the temerity to show a cluster of medals in his shop window, one of which was struck years before he had ever exhibited a photograph.

What would happen to a man in the army if he sported the medal of a deceased or retired officer for a battle fought before he became a soldier? I think, with "Ton Don," the question is very important of how to protect true merit: will some of your readers think this over? And I should be glad to know if any other photographer can tell of such an instance as the above.—Obediently yours, H. POITERS.

Brighton, March 20th.

P.S.—Cannot a Society be got up to manage such matters?

SAYINGS BY MEN WE KNOW.

SIR,—Mr. Nelson K. Cherrill is saying that "new laid eggs will make albumenized paper as permanent as carbon tissue."

Mr. Bovey is saying: "I wish it was true."

Mr. Anthony Rivot is saying: "Pity, 'tisn't true."

The Autotype Company is saying that "M. Lambert is accompanied by his friend and coadjutor Mr. Sarony Lambert;" and that "he is an able negotiator."

Jo. Vestris is saying that Mr. Sarony Lambert is not the only "able negotiator" he knows.

Mr. J. K. Sawyer is saying that "it is not to be expected that chromotype licensees will give the results of their trials and experiments to the world at large."

Mr. George Croughton is saying: "Chromotype licensees are nothing to give."

Mr. A. Wellesley Turner is saying: "Anybody can produce good work by following out my instructions."

Fry and Co. are saying: "Turner's papers are full of instruction; but a day with us is worth ten times the money we charge for demonstrations."

Mr. Higginson is saying: "Chromotype for ever."

Mr. James Hughes is saying: "Higginson beats Lambert."

Mr. Ayton (of Edinburgh) is saying: "I have relinquished my Lambertype exclusive rights out of pure pity for the poor photographers of Edinburgh."

The Autotype Company is saying: "If the other exclusive licensees don't come to terms like Mr. Ayton, we must start the £5 Autotype dodge once more."

ONE WHO HAS LISTENED.

EXHIBITION IN PARIS 1878.

DEAR SIR,—Having applied for space in the coming Paris Universal Exhibition of 1878 for large architectural photographs, &c., I find that wall space, in the shape probably of screens, will have to be provided by the exhibitors, either singly or in concert. As applications were requested to be sent in by this day, it is possible that English photographers have already agreed upon concerted action for this purpose. Can you inform me, and, perhaps, other intending exhibitors, whether such is the case; or, perhaps, some correspondent may be able to direct us what to do in this matter.—I beg to remain, sir, yours truly,

W. H. WHEELER.

[No special or concerted arrangements have been made by photographers, so far as we are aware. We will endeavour to ascertain if anything in excess of the general arrangements announced is likely to be made by which photographers may benefit.—ED.]

RAPIDITY IN CARBON PRINTING.

DEAR SIR,—Sir Thomas Parkyns having taken umbrage at my remarks on his description of Mr. Witcomb's rapid method of working the Lambertype process, proceeds, "in his capacity as a juvenile boxer, to hit hard in the dark." I beg to parry and counter. I believe these are the terms used in fistic parlance. I must first admit my error as to the time expended in producing the prints in question, which I should have stated as seventy-seven minutes, instead of sixty-seven. The negatives were placed in the frames, exposed three-and-a-half tints, transferred to the collodionized glass, developed, passed through the alum bath, dried *slowly*, moistened again, the transfer paper applied, and again dried *slowly*. These slow dryings bother one exceedingly, and as Sir Thomas declines to answer any anonymous correspondents in future, can any of your numerous readers furnish more light on this subject? Does slow drying mean ten minutes, or one hour, or what time? I find at this time of the year, if the prints are required to be stripped from the glass with full gloss, from twelve to twenty-four hours are required.

I have this day gone through the process full tear, and managed to get a print off in two hours and five minutes from starting, but I had to dry rapidly at a fire-rose fire, and the result is imperfect from too much hurry. As to exposure, I find that with the Autotype Co.'s actinometer, three tints in full sunlight require ten minutes; in the shade three tints require thirty minutes, and in a glass printing house three tints require fifty-five minutes.

I am not a Lambertype licensee, although I have a quantity of Lambertype material, purchased from those who cannot work the process satisfactorily; but I can make as good prints by "Autotype Process only," which Sir Thomas suggests is not one of the perfected processes.—I am, dear sir, yours very truly,

H. W.

Talk in the Studio.

DEALING WITH PHOTOGRAPHIC TRAVELLERS.—Referring to the case recently tried in the County Court at Lynn, a correspondent wishes to caution provincial photographers, he him-

self having been victimized. The traveller obtained goods which were to be paid for by goods supplied by the firm which he represented. The goods arrived, with an invoice from the firm, which had to be paid, whilst the goods obtained by the traveller remained unpaid for. Provincial photographers will do well to be cautious how they enter into similar somewhat irregular transactions.

RETOUCHING LEAD.—We have been favoured by Mr. Lafayette Harrison with examples of an American aid to fine retouching in the shape of fine pointed pencils of metallic lead. The "Boss retouching lead," as it is called, receives and retains a finer point than the ordinary plumbago pencil, and permits much finer work and higher finish. A pad having two sides, with a sanded surface of different fineness, is used with the lead, and readily gives it a fine point. We commend this pencil to our readers, as it seems efficient and cheap.

THE NEW PHOTOGRAPHIC ATTACHEE.—This is a clever little contrivance introduced by Mr. Woodbury, and to be obtained of the Sciopticon Company. It is one of the most useful little contrivances we have seen for a long time. Its object is to fix mounted photographs and other cards in albums, scrap-books, &c., or to larger mounts. It forms an ornamental corner for holding the card, two thin brass ends passing through the scrap-book leaf, and turning up at the other side, holding the card firmly by the four corners, and giving an ornamental effect rather than detracting from the neatness of appearance.

To Correspondents

••• To AGENTS AND ADVERTISERS.—Next Friday being Good Friday, the PHOTOGRAPHIC NEWS will be published on Thursday, March 29th. Advertisers should send in their Announcements not later than Wednesday, March 28th.

P. B. R.—Your enclosure is not a carbon print at all, and unless you are unconsciously inexperienced, you could scarcely think it was so. It appears to be a piece of carbon tissue which, having been placed in contact with a negative whilst moist, has torn a portion of the negative film away on attempting to separate them. In placing a piece of tissue, consisting of gelatine or glue, in contact with a negative, it is imperative that the tissue should be quite dry. It is very wise, for beginners at least, to adopt the precaution suggested by Mr. Swan, always to brush the surface of the tissue over with some powdered French chalk as a preventive of sticking to the negative.

J. B.—You can obtain the fullest information of the Autotype Company, Rathbone Place. You cannot work the carbon process professionally without a licence to be obtained of the Company. The question whether it is worth while to purchase a licence for a small town, and which licence, is one which you can only decide satisfactorily for yourself. It is our impression that it will pay all professional portraitists to do so, as it will, without doubt, bring an extended connection, and the carbon prints command higher prices than silver prints.

C. F. M.—We should select the second on your list. Having a shorter focus in relation to its aperture, it will be the most rapid.

ORUS.—The officials at Stationers' Hall do not conduct business by correspondence. Personal application must be made by some one. A copy of the work to be registered must be taken, and the fee paid. That is all.

DAVE.—A mixture of size and lamp black is generally used for blacking the inside of cameras. Or black paint with very little oil, turpentine being used instead, may be employed.

INQUIRER.—We cannot say whether it is precisely the same edition or not. In substance it will doubtless be the same; but it is probably a new edition since the date you name.

G. F. SUBSCRIBER.—A few weeks ago we devoted an article to the subject. It describes the use and value of reflecting screens in lighting the sitter. We believe it is a useful pamphlet; but whether it is worth the money to you must be decided by yourself.

B. G. F.—We presume that the use of barytes in the bath did not become common when Dr. Vogel first suggested its use, because many photographers did not think their baths contained sulphate of silver. There is danger of using excess of nitrate of barytes in the bath, as, being a somewhat insoluble salt, it might be precipitated by the accumulation of nitrate in the bath, and, by its precipitation, produce the pinholes it had been originally added to remove. Nitrate of barytes is soluble in eight parts of cold water. This is, however, the limit of its solubility, and some samples are less soluble. It is, moreover, very easily precipitated from its solution by alcohol. Although photographers are not likely readily to add sufficient to oversaturate the bath, it is well to keep very far on the safe side, especially if the free addition would tend to produce offensive hardness in the negative.

A. H. FAX.—You are right in conjecturing that the use of the term "yolk of an egg" is an error. It should have been "white of an egg."

M. G.—As a rule, all objects in the extreme distance will be sufficiently in focus when foreground objects are in focus; but this is affected by conditions of lens and aperture. The distance beyond which all objects will be in focus depends on the aperture as well as the focus of the lens. It is calculated that with a lens of one-inch focus, and an aperture of one-fortieth of that focus, all objects beyond a distance of four feet will be in focus. Following the same calculation, and adding four feet for each inch of focus, you may ascertain the distance with any lens. Thus, with a lens of ten inches focus, and a quarter of an inch stop, all objects at a distance of forty feet and upwards will be sufficiently defined.

J. C. STENNINO.—We procured the *Builder* of the date mentioned, but could not find any notes of the lecture.

A. YOUNG AMATEUR.—We always avoid the use of acetic acid in the nitrate bath, as it is not necessary, and very difficult, if not impossible, to eliminate without throwing down the silver. The best plan, when excess of it has been added, is to dilute with more neutral nitrate bath. 2. The recommending fresh hyposulphite solutions for fixing is to secure the use of a fresh quantity every time. It does not take any harm from being kept in solution, but there is always risk in using it over and over again. You may, with propriety, keep a stock in solution ready for use, but avoid using the same quantity over and over again. 3. You cannot ascertain the strength of a silver solution without apparatus. 4. Ordinary glazed earthenware would not be safe for boiling down a nitrate bath. Some kinds might possibly answer, but in others the glass would crack. As a rule, a porcelain vessel would serve, but it is much safer to use a proper evaporating dish. The vitreous ware of Edwards and Son, of Burslem, kept by most photographic dealers, answers admirably. 5. In sunning a bath, it may be exposed in a bottle, but it is better in an open dish.

SAM. VERHAEGHE.—Many thanks.
Several Correspondents in our next.

METEOROLOGICAL REPORT FOR FEBRUARY.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Brayton, near Whitby, 35 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1 28 10	30 72	28 71	46°	49°	48°		Showers of small rain a.m. and p.m.
2 28 64	29 83	29 69	48	48	48		Rain a.m. and p.m. Windy
3 29 70	29 79	29 70	46	45 5	43		Hail and rain a.m. and p.m. Windy
4 29 80	29 92	30 01	42	45	44		Fair and bright
5 29 90	29 91	29 99	45	48	46		A little rain this morning. Fair, but gloomy the rest of the day.
6 29 93	29 91	29 84	48	48	48		Small rain a.m. and p.m. Foggy.
7 29 83	29 89	29 94	47	49 5	45		Fair, generally sunny
8 29 94	29 88	43	—	44	44		Fair, generally sunny
9 29 91	29 86	29 62	44	47	48		Rain this afternoon
10 29 85	29 55	29 04	47	50	47 5		Rain this evening.
11 29 50	—	29 66	45	—	46 5		Rain early this morning.
12 29 32	29 40	29 42	48	46	46		Rain early this morning. Fair and sunny the rest of the day.
13 29 46	29 50	29 67	46 5	48	41 5		Fair, generally sunny
14 29 67	29 67	29 67	50	54	48		Rain early this morning
15 29 8	29 42	29 44	48	—	44 5		Rain morning and evening
16 29 48	29 57	29 61	43 5	45	45		Showers p.m.
17 29 77	29 61	29 66	43	47	46		Rain this evening. Fair and sunny the most of the day.
18 29 80	29 80	29 73	46	48	42 5		Rain this morning and evening
19 29 64	29 53	29 00	42	44	48		Rain at night with strong wind. Moon
20 29 10	29 24	29 47	40	45 5	40		Rain early this morn., showers this afternoon
21 29 76	29 79	29 92	36	42	34		Fair and sunny at 7.30 a.m.
22 29 99	29 79	29 68	50	39 5	42		Rain this afternoon. Temperature 28°
23 29 84	29 81	29 74	40	46	45		Fair and sunny. A few drops of rain at night
24 29 47	29 30	47	—	45 5	45		Rain a.m. and p.m.
25 29 12	29 16	29 07	41	44	39		Showers about 12 o'clock. Drizzling rain this evening
26 29 24	29 30	29 61	34	40	29		Fair and sunny
27 29 63	29 7	29 34	28	29	29		Fair, generally gloomy. Rather windy
28 29 06	29 11	29 18	26 5	37	25		Fair and sunny

Summary.				Mornings. Noons. Nights.			
Highest temperature	...	...	...	30°	...	48°	...
Lowest ditto	...	...	...	28	...	29	...
Mean ditto	...	...	...	42°	...	44°	...

Mean of all observations	...	...	...	45°	...	...	...
Fair days	...	...	...	...	...	...	9
Days on which rain fell	...	...	...	...	...	...	19
Fair days sunny	...	...	...	...	...	...	8
Fair days gloomy	...	...	...	...	...	...	1

Notes.—Many of the early spring flowers are now in bloom, clearly showing the mildness of the season. We, however, had one or two days of sharp frost, as will be seen by referring to the foregoing.

The Photographic News, March 29, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO PHOTOGRAPHS OF BY-GONE CELEBRITIES—A GENERAL MAID-OF-ALL-WORK

Photographs of Bygone Celebrities.—With all the portrait publications that have appeared, and are appearing, there is not one that has given its readers a series of a nature which they could not otherwise easily procure in another way. It is true that the periodicals to which we allude have given photographic portraits to the public at a much cheaper rate than the pictures could have been otherwise obtained, and moreover the latter have been printed by a permanent process; but something more than this might have been attempted. Following in the wake of *Vanity Fair*, and publications of a like character, the *Figaro*, *Programme*, the *Theatre*, the *Programme*, *Men of the Time*, and *The Portrait*, have been content to give their readers portraits of ladies and gentlemen more or less celebrated, the negatives of whom are doubtless easy to secure. We think they might have given us something more than this. There are many celebrities who have lived since the days of photography, but whose features are fading from the remembrance of some of us, and have never been seen by the rising generation, whose portraits, especially if printed by a permanent photographic process, would be particularly welcome. We need cite but a few names. There is Thackeray, for instance, of whom many good photographs were taken, although such are rarely seen now-a-days; Macaulay, whose image would be eagerly sought for by many; Wellington, of whom doubtless there exists a Daguerreotype or two, if nothing else from which copies might be taken; the late Prince Consort's picture is another that would be in demand. And then there are many in the domain of science, beginning with Cuvier and Fox Talbot, of whom portraits are to be had that could soon be vulgarised. We shall of course be met by the objection that such pictures as these are rare, and very difficult to obtain; that permission to copy them would cost a very large sum of money; and that therefore the publication would be unremunerative. But all these arguments should have little weight with enterprising publishers. Of course, if portraits are published at a few pence each, we can well understand that little profit will attach, unless very large editions are sold; we also comprehend fully that if publishers can get their negatives for nothing, they prefer to do so, as then their takings are all profit. It is nothing new to suppose that a photographer need not be paid for his trouble, and consequently the reason why we are treated with so many pictures of the *dis minores* is very apparent. If photographers would only lend their negatives for the purpose, no doubt we should have seen some of the celebrities we mention published ere this. Unfortunately photographers want to be paid for their work, and the consequence is that the public do not get the opportunity of purchasing what they would most prize. A photographer might require twenty or thirty pounds for the use of a negative of Thackeray or Macaulay, whereas one of the renowned Miss Boventine can be had for nothing. But then the public, somehow, get tired of the latter's portrait, in every variety of dress and undress, and no doubt hold a few pence quite enough to pay for it. It would be different, we think, if it were a question of such portraits as those of Palmerston, Cavour, Alexandre Dumas, Wellington, Macready, to name a few of those at random whose photographs are comparatively rare. A fair price would never be refused for portraits of such worthies, and the extent to which they would be sold would realize a sufficient margin of profit, after paying the owner of the original a good bonus. Even in the case of people already possessing photographs of the celebrities in question, the pictures in many cases have faded or become discoloured,

and collectors would only be too glad of the opportunity to replenish their albums with fresh copies, especially if, as we have said, a permanent process were employed in the printing.

A General Maid-of-all-Work.—Photography has oftentimes been termed the handmaiden of science, but it would be hard to say in what connection our art is not used now-a-days. Colonel Baratti, the editor of an Italian journal devoted to photographic literature (the *Camera Oscura*), which has, however, of late ceased to be published, cited an instance a little while ago of how he employed the camera in the art of gardening. He had a choice fruit tree which required pruning, but hardly trusted himself to do the work. He had a friend, however, in Florence, who bore a great reputation for such matters, and consequently decided upon taking advice upon the subject. The Colonel photographed the tree, sent the picture to his friend in Florence, and in a few days received it back properly pruned; the rest he did himself. Here is an example out of many, and affords a good sample of what can be done by a happy employment of the camera. It is a common thing with West-end hatters to have their stock photographed, and a purchaser in the country has simply to send his number to town and specify which of the pictures pleases him most, in order to receive back the kind of head-gear he wishes to carry. Photographs showing the manner of wearing the hair we have also seen, so we may suppose hair-dressers adopt this method of demonstrating the various *coiffures* in fashion. One of these days we shall have tailors employing photography in the same manner. Army tailors, by the way, do so already, and we remember, a few years ago, to have seen a series of pictures, executed, we believe, at the Woolwich Photographic Establishment, showing the cut and facing of the various tunics throughout the army. Great stress is laid, as our readers know, upon strict uniformity in soldiers' clothing, and on a recent change of costume it was decided to forward to each commanding officer of a regiment a photograph of the "regulation" tunic. In this inexpensive way all those in authority were properly apprised of the changes that had been decided upon. We have no doubt that tailors other than regimental ones will avail themselves of the same plan. There are many people in the country, on the Continent, and in distant Australia, who wear no other clothing than that made in the metropolis, and transmit their orders regularly to Bond Street or Saville Row to be supplied with apparel. Here photography might be employed to far greater advantage than lithography or wood engraving for giving an idea of shape or pattern, and the same holds good with ladies' and children's costumes. The difficulty, probably, would lie in securing models in conformity with the taste of the tailor or dressmaker, for these, we hold, would be somewhat difficult to please. The main drawback to the adoption of photography by tradesmen in general would be, however, the circumstance that it leaves no room for romance. The beautifully illustrated catalogues which show magnificent furniture at low prices, ornamental fenders for eightpence, and elegant arm-chairs at ten shillings a piece, would cease to exist if photography came into general use. We do not say it would be impossible to deceive even with the camera, but at any rate an article would have to be in existence before it is photographed, and such is evidently not the case with many "fancy" articles now-a-days.

THE NITRATE BATH: ITS DEFECTS AND RESTORATION.

BY JOHN SPILLER, F.C.S.*

THE treatment of the nitrate bath has so often formed the topic of discussion in the photographic journals, that it would appear a task of some difficulty to say anything new

* Read before the Photographic Society of Great Britain.

upon the subject, and it is rather with the view of collating the scattered items of information than of contributing fresh matter, that I venture to introduce the subject once more to the notice of the members of this Society. My effort has been chiefly directed to the examination of certain deposits, kindly furnished me by Mr. H. J. Burton, of the Autotype Company's Works, and by Mr. Frederick York, in the hope that the chemical results arrived at may point to the origin of some, at least, of the defects encountered in working on a large scale, for it is manifest that the more limited operations of the amateur do not offer the chance of so fully disclosing the nature of the changes brought about in the process of sensitizing the collodion plate.

Before specifically describing these results, I propose to remind you briefly of the chemical reactions involved, which may be stated somewhat as follows: Collodion composed of one or other of the known qualities of pyroxyline, dissolved in ether and alcohol, and sensitized with the bromides and iodides of potassium, ammonium, or cadmium, is, after partial evaporation in the air, brought into contact with an aqueous solution of silver nitrate, charged nearly to the point of saturation with the bromide and iodide of silver, whereby a sensitive coating of bromo-iodide is formed within the texture of the collodion film, and this remains moistened with the excess of bath solution. By repeated employment it is manifest that the bath becomes in time *fully* saturated with the haloid salts of silver, and contains, besides considerable quantities of alkaline (or cadmium), nitrate, together with ether and alcohol; and, in addition, certain extraneous matters derived from impurities in the iodizers employed. Beyond these we may now expect to find traces in the bath, arising from the use of certain "organifiers," which are often intentionally prescribed as helps to sensitiveness when the plate is being exposed in the camera.

All goes well for a time, but after a longer or shorter interval these secondary compounds accumulate, and begin to exert their special action upon the plate, particularly when, by frequent use, the proportion of silver becomes sensibly reduced. For every plate immersed, an amount of potassium (or cadmium) nitrate equivalent to the salts of silver removed, must inevitably be left in the bath, with also increasing amounts of ethylic compounds and other organic matters. Hence has risen the recommendation to use two or more baths in succession, to overcome the disturbances induced by the first immersion, and I cannot see any valid objection to this mode of working. Mr. J. Brier, jun., proposed such a plan in the YEAR-BOOK OF PHOTOGRAPHY for 1876, and there are earlier suggestions to the same effect. By the slow oxidizing action of silver nitrate upon ether and alcohol, acetic and glycollic acids may be formed; also possibly oxalic, picric, and fulminic acids may exist or be generated from certain organic impurities present in the pyroxyline of the collodion. Mr. Warnerke tells me that two years ago he met with a remarkable instance of the formation of fulminating silver in the nitrate bath, but none of the deposits I have recently examined show the least indication of detonating properties. Mr. York, Mr. Brooks, Mr. England, and others have recorded the occurrence of explosions happening during the process of evaporation to dryness, or subsequent fusion in order to recover the silver from an unserviceable bath, but we must remember that deflagration may always be looked for when silver nitrate is fused with any kind of organic matter, and, in some instances, glycerine may have been intentionally added to the bath during a period of unusually hot weather, and this circumstance, afterwards forgotten, might give rise to an explosion when the attempt was made to recover the silver by fusion. I have looked carefully for oxalic acid, but never yet found it, although acetic acid, and possibly aldehyde and nitric ether, must occur as oxidation products derived from the ether and alcohol. These bodies give rise to the peculiar smell always apparent in a well-used bath.

Another circumstance which recent examination has fully demonstrated, is the frequent occurrence of sulphate of silver as a bath deposit—a fine example of which has been sent to me by Mr. H. J. Burton. It is in the form of feathery needle-shaped crystals, almost insoluble in water, and separating out whenever a strong nitrate bath containing it is diluted with water. Its origin may be traced, first and foremost, to the iodide and bromide of potassium employed in the collodion, for these salts, as found in commerce, almost invariably give a precipitate with barium nitrate, due to the presence of alkaline sulphate as an impurity. Or, secondly, the sulphate may be introduced with the silver, especially if worked from residues containing sulphide, the metal from which, when acted upon by nitric acid, must necessarily give sulphate. Properly refined silver should not retain any sulphur, but, unless the silver from residues be fused with nitre, I have often found sulphide of silver in the bottom of metal reduced with alkaline carbonates alone, and I am inclined to believe that the presence of gold (so common in photographers' residues) favours the retention of the sulphur. Mr. A. L. Henderson must have been aware of this general occurrence of the sulphate of silver when recommending the addition of nitrate of barium to the bath solution, and all testimony agrees in approving the use of this chemical agent as an addition to the bath, which is calculated to overcome, at least, one fertile cause of pinholes. The late Dr. Maidstone Smith reported highly of it a year ago.* Mr. York now uses it, and several operators have recently recorded their experience in the same terms.

Much curiosity attaches to the startling proposal of Mr. Henderson to add also ferrous to the nitrate bath. This has not been done since Mr. Fox Talbot used for special rapidity an iodide of iron collodion, which necessarily introduces ferrous nitrate into the bath; and it would now be important to know more exactly the proportion of iron to be employed. Mr. Henderson's formula in the *British Journal Almanack*, 1877, being somewhat indefinite on this head; two drachms of a "solution of nitrate of iron" being described for a fifteen-ounce bath, with ten grains of the barium nitrate added. When making experiments at Woolwich some years ago, I was astonished to find that the reducing action of ferrous salts was, after all, very imperfect, for it was possible to expose mixed solutions of iron and silver to sunlight for many hours without complete reduction being effected. Always some silver remained in solution side by side with the ferrous salt, and with the knowledge of this fact, I think the new suggestion well worth a trial.

Another method of clearing the silver bath when it begins to show a disposition to form pinholes is to treat it with a very weak solution of pure cyanide of potassium. Mr. A. Borland gave exact details in the YEAR-BOOK for 1876, and Mr. H. J. Burton has carried out the same idea with good effect. One of the silver deposits obtained in re-working a bath at the Autotype Company's establishment consisted mainly of the cyanide of silver in beautiful nacreous crystals, and this led me to enquire whether such a process had not been employed, when Mr. Burton kindly replied that he had often used cyanide of potassium, as he "finds it improves the sensitiveness of the nitrate bath, and gives negatives of very great delicacy." Here, again, we have an instance of a mild reducing agent being added directly to the bath solution, giving rise to the precipitation of a small quantity of cyanide, which carries down with it the excess of iodide of silver. In the early days of photography, M. Le Gray used cyanide of potassium in the wax-paper process as an addition to the iodizing salts, but much in the same way that the fluoride was prescribed, which we know to be altogether inoperative; the idea seems to have emanated from the desire to mix up together all the haloid salts of silver on the chance of the best

* YEAR-BOOK OF PHOTOGRAPHY, 1876, p. 67.

results being obtained by one or other of the many possible combinations.

The mode of sunning the bath with or without a trace of chloride cannot be made available in the winter season, and there is then the acidity to be corrected. A good account has been given of the method of partial precipitation by citric acid, or an alkaline citrate, which is said to carry down with it the excess of argentic iodide; but this mode of proceeding I have only used in connexion with the printing bath, where it answers admirably. For restoring a disordered negative bath, the common practice is, as we all know, to dilute the solution with an equal bulk of distilled water, filter off the precipitated iodide, and make up the strength again with fresh crystals of nitrate of silver; but this process defers only for a time the evil complained of, and is not considered an altogether effectual remedy.

The general conclusion which blends best with all the recorded facts would seem to point to the use of potassium cyanide, added in quantity sufficient to produce a permanent precipitate in the solution, and then to add barium nitrate in slight excess, so that all the sulphate and excess of iodide may be removed with one filtration. If cyanide of barium could be had commercially, a solution of this salt containing within itself the necessary ingredients, would at once accomplish all that is desired to bring about the rectification of a disordered bath.

REMARKS ON THE SILVER BATH.

BY F. YORK.*

I AM not one of those happy individuals who never get into trouble with the nitrate of silver bath, for this happens very frequently, not from freaks with ethyl compounds, but from exhaustion. Last season I worked in comparative comfort. I found that nitrate of baryta was a panacea for a disordered bath. My mode of treatment was to add a grain of this salt to each ounce of solution, boil it for ten minutes, dilute to its proper strength, expose it to sunlight until the bath in use gave out.

I found that a bath after repeated treatment in this manner produced clean but weak negatives, requiring double the exposure. I concluded that the best plan was to reduce it with copper, or, as Captain Abney expresses it, to make a new bath out of an old one. I have sent some of the solution, after reduction, to Mr. Spiller, thinking he may find something not reduced by the copper, which would enlighten us. I attach so much importance to the baryta salt as a specific, that I am most anxious to know its chemical action. We are told that a bath giving pinholes, or, as it is commonly called, a sandy bath, arises from super-saturation with iodide and bromide. This is, of course, a reasonable conclusion, for by diluting it with water, iodide of silver is precipitated. I have used a bath so thoroughly saturated that when poured out it was quite yellow with iodide.

Fulminate of silver has been suggested as the cause of pinholes. I am not prepared to argue this point, but think it not improbable that such a salt is formed. I find that fulminate of silver consists of silver, oxygen, hydrogen, and nitrogen; the fulminate of Leibis is a cyanate of silver; the cyanogen for the production of the cyanic acid being derived from the carbon of the alcohol, and the nitrogen of the nitric acid. An old silver bath contains all these elements. One of the peculiarities of an old bath is, that after standing a few days a crop of numerous transparent needle crystals form on the dipper and sides of the bath. I have seen them a quarter of an inch long. I once collected a small phial full, but cannot find it at present. This is unfortunate, as Mr. Spiller may have detected their composition. I never get them now. These crystals are considered an iodo-nitrate; is it so, or are they fulminate?

* Read before the Photographic Society of Great Britain.

The usual mode of treating a bath in this state is to dilute it, filter out the precipitate, add fresh nitrate of silver to make it the proper strength, or boil it down to that. I have found the nitrate of baryta remove this grievance most effectually. What is the cause? I am unable to do more than offer suggestions. With regard to the fulminate theory, I am induced to think there is some foundation for its presence, for I have often found, when fusing an old bath, a series of sharp detonations when stirring it. I have noticed this more particularly with baths in which cyanide of potassium has been used as a corrector. I am quite satisfied in my own mind of the value of nitrate of baryta in reducing these crystals, and think we ought to know its chemical action. Is it possible that an oxalate of baryta is formed? For I find in the *British Journal* that Mr. Williams, of the firm of Hopkins and Williams, discovered in the residues, after the distillation of old collodion, as much as five grains of oxalate of lime to each ounce of collodion distilled. This is about the weight of the iodizing salts used in each ounce of iodized collodion. Is it possible, the Editor suggests, that those crystals may be oxalate of silver?

I should also like to be informed why the silver reduced from bath solution by copper when converted into nitrate, and a bath made from it, that it should be still saturated with iodide of silver. This salt does not appear to be got rid of after refining. I once precipitated some old baths as chloride, and sent it to the refiners. The metal was returned. I made it into nitrate of silver, and, strange to say, that when I dissolved it in distilled water it turned yellow, as though iodide has been added to it. I tried it for printing, and had great difficulty in toning, as though iodide were present.

The Editor of the Society's Journal has the following note on the above:—

"It will be noticed that Mr. York calls attention to the fact that when the silver from an old bath is precipitated by the addition of metallic copper, the silver iodide is left unreduced. In making a new sensitizing bath from an old one this is of no importance, as any excess of iodide can be filtered out; but it is well worthy of notice that the reduction of the salts of silver to the metallic state is not completely effected by copper. Neither the iodide, the bromide, nor the chloride of silver, are decomposed by it. In fact, these haloid salts of copper are partially or entirely decomposed by soluble salts of silver, the haloids of the latter resulting from their contact with it. If it be desired to reduce the iodide to the metallic state, it is a better plan to throw granulated metallic zinc into the old bath, slightly acidulated with either sulphuric or hydrochloric acid. This will reduce all the silver salts to the metallic state. To get rid of any excess of zinc, acid must be added till all action ceases, and the precipitated silver must be well washed. If hydrochloric acid have been employed, it is advisable to rinse with ammonia before the final washing.

MR. SWAN'S PATENT.

BY JOHN URE.*

WITH the view of eliciting discussion on a subject I deem of considerable importance to our profession, I beg to submit the accompanying suggestions, which, if you deem advisable, may be read to the members. You are, no doubt, aware that Mr. Swan's patent on the carbon process expires next February, and the Autotype Company will doubtless use every effort to obtain an extension of the same, and thus prevent the improvements that would be certain to follow from healthy competition if the matter were thrown open to the profession.

The carbon process has already raised considerable controversy in the journals, and I would further remind our members of the motion, passed last season, binding us to

* Read before the Glasgow Photographic Association.

use every means to prevent a renewal of the patent. My sole reason in taking this course is that the process may be untrammelled, and improvements effected in the manipulation, instead of being worked by a few licensees, as at present—some eight or ten in Glasgow, and only one or two practising the process, and that to a very limited extent. Now, as the Autotype Company seem to aim at the establishment of a monopoly of this process by buying up all the patents connected with the subject, and as Mr. Swan's patent is the basis of all the others, I would humbly suggest that it is our duty, seeing it has no valid claim to originality, to oppose by every legitimate means its extension, as it is well known that many others worked the process before the date of Mr. Swan's specification. Proof of this can be produced, written and otherwise, to convince the Lord Chamberlain that the subject of the patent was not new, and that the Autotype Company in this monopolising spirit were seriously impeding and hurting the advancement of the art.

In support of this view we have the written testimony of Fargier, Ponton, Poitevin, and Blair, besides many others, who had previously used the same. But, in addition to this, there is another flaw in the patent, namely, that in the provisional specification and the final one different principles are mentioned—an error at once fatal and illegal, as decided by the highest law court in the country within the last few weeks in the case of Messrs. Bailey and Son, manufacturing chemists, Wolverhampton, against a person in our city for using an invention for preserving meat, known among butchers here as the "doctor." Now, the only difference in the provisional and final specification is that in the former bisulphate of lime and gelatine is used, and in the latter bisulphate of lime may be used alone. Judgment was given for the defendant, as a case in every respect parallel.

Another reason that should stir us up in the matter is that one of the partners of the Autotype Company was in Scotland the other day endeavouring to buy back the licenses from those who have the right of granting district licenses. Now, what is the meaning of this if it be not to continue the monopoly?

Again, I have been told that proceedings have been threatened against parties who have gone into enlarging for the trade. Now, in the face of these facts, is it not time that we should be getting up proof and a fund to combat these proceedings? If the Autotype Company really consider these patents valid, why do they not at once settle the matter in our courts of law? But I fear they know the weak points too well to trust to the searching examination of a Scottish court.

In conclusion, my advice to all is to work away, for if I thought the process a commercial success—which I do not without further improvement—I would at once adopt the carbon process, and ask permission from no one, as I have worked it before the existence of any of the Autotype Company's patents, and will do so again when more perfect.

ORGANIC AND INORGANIC MATTER: THEIR USE IN BROMIDE OF SILVER SOLUTIONS.

BY J. JOHNSTON.*

To have organic matter in conjunction with bromide of silver, so that it may act as a vehicle for distributing it equally over a suitable surface, is a necessity in emulsion work. The other function, or functions, which it performs not being so apparent as the one already alluded to, the question has been, on that account, often raised as to what action organic, and likewise inorganic matter have on bromide of silver to produce the real or fancied changes attributed to them.

I have always looked upon the solution of the above question as the key to the successful preparation of bromide of silver emulsions, and have, in consequence, given my

attention to it for a considerable time. The conclusion that I have come to is that the property of affinity possessed by the bromide of silver enables its molecules to combine with the molecules of organic and inorganic matter, which possess a similar property of affinity, and in such a degree the combined molecules just neutralize the affinity of each other, the result being that a molecule of bromide of silver with its equivalent of matter, either organic, inorganic, or both, remains in a neutral state as regards its affinity for another molecule of bromide of silver. This conclusion has been arrived at by observing the formation of bromide of silver, and certain peculiarities connected with it after its formation.

I now propose to show the nature of my reasoning, and for that purpose will assume a case of the formation of bromide of silver in water. I have selected water, as in it the peculiarities of the affinity possessed by bromide of silver appear in a very decided form.

On adding silver nitrate in solution to a soluble bromide in solution a substance is formed of a pale yellow colour, which, I need scarcely add, is bromide of silver. At the instant of its formation it presents a fine creamy appearance, after which it is seen in a perceptibly granular state, being deposited on the side and bottom of the vessel in which it is contained, and in this condition is unfit for photographic purposes. I have no doubt that these features in the formation of bromide of silver are too often unpleasantly familiar to those engaged in emulsion work. However, I have found them very serviceable in pointing out the means to an end.

The creaminess first observed is always a sign of the silver bromide being in a fine state of division; the granular state which succeeds it is undoubtedly caused by the affinity which the molecules of bromide of silver have for each other. I have thought it necessary to assert this, as much depends upon the fact.

If some of the deposited bromide of silver be examined closely it will be seen to be composed of separate particles, all of which appear to be about the same size, and they, apparently, have no further tendency to increase in size or join with each other; they appear to be in a neutral state, as if some condition of affinity had been satisfied.

Now, instead of a very great number of molecules of bromide of silver being required to join together to produce a state of neutrality in the particle which they compose, only two were required; it is evident that bromide of silver, in a fine state of division, would be the result. But this cannot be done, and even if it could, it is very doubtful if pure bromide of silver in a fine state of division would be photographically more serviceable than it is in the granular state. Here, then, it is where organic or inorganic matter comes to our aid.

In experimenting with ammonia and bromide of silver combined, and subjected to heat, I have been able to increase the affinity of the silver bromide; and, on the other hand, by adding acetate of ammonia and gelatine to silver bromide, and applying heat, I have caused the silver bromide to assume a fine state of division. From these and many other experiments I found that ammonia is a suitable agent for bringing organic matter in conjunction with the molecules of bromide of silver to produce a state of neutrality in them. The action of suitable organic matter on ammonia would appear to be to reduce its affinity to a degree to just produce neutrality in the bromide of silver molecules.

I will show you a sample of bromide of silver in a neutral condition. This bottle contained bromide of silver suspended in the liquid which is now in it, but, being undisturbed for a period of three months, the whole of the bromide of silver has been precipitated. My object in having it in this condition is for the purpose of solving a rather important problem in emulsion photography, which is to separate the soluble and unnecessary salts—which are the products of the formation of silver bromide—from the bromide of silver, without the necessity of having to wash the emulsion,

* Read before the Glasgow Photographic Association.

The experiment will, therefore, answer the double purpose. I hope at the next meeting of the Association to have time to show bromide of silver in the condition already referred to.

ALKALIMETRY.

BY J. CHISHOLM.*

Preparation of the Standard Acid.—Ordinary sulphuric acid, 1 fluid ounce diluted with 7 fluid ounces of water, and the mixture allowed to cool. Weigh 1 gramme of anhydrous carbonate of soda, and dissolve it in about 10 to 15 cubic centimetres of water. Pour the diluted acid into the burette up to zero, and let it drop into the solution of carbonate of soda, to which a litmus solution has been added. Let the acid in the burette drop carefully into a boiling flask containing the carbonate of soda solution till the colour turns red; now boil the flask to expel the carbonic acid. The process is finished if, after boiling, the red colour remains.

In our example we found that 6.4 cubic centimetres by the burette were used to neutralize the carbonate of soda, and we wish to form a solution such that 10 cubic centimetres would neutralize 1 gramme of carbonate of soda. We have therefore the following proportion:

Acid	Water	Acid	Water	Acid	Water
10—6.4=3.6	∴ 6.4	8.8	∴ 200	112	

Equal the amount of water required to make a standard acid solution.

To Test Commercial Carbonate of Soda.—One gramme by weight is treated as above described; and, of course, the less acid used, the more impurities in the carbonate of soda on trial.

For example, if we use only 5 c. c. of the acid to neutralize 1 gramme of commercial carbonate of soda, it would follow that only one-half or 50 per cent. of carbonate of soda is contained in the commercial article, while the rest is impurities. If, for instance, we use 9.1 c. c. of the acid, it would follow that the article on trial contained 91 per cent. of carbonate of soda.

In order to compare the strength of commercial ammonia with the carbonate of soda, we took for our example 10 c. c. of liquid ammonia and used 41.5 c. c. of the acid until the blue litmus turned red. Hence it follows that 10 c. c. of the normal acid would neutralize 2.4 c. c. of ammonia; and as 10 c. c. of the acid also neutralizes 1 gramme of carbonate of soda, it follows that 2.4 c. c. of ammonia is equivalent to 1 gramme of carbonate of soda.

Acid	$\frac{c.c.}{NH_3}$	Acid	$\frac{c.c.}{NH_3}$
As 41.5	∴ 10	∴ 10	∴ 2.4

Therefore 2.4 c. c. of liquid ammonia would be equivalent to 1 gramme dry carbonate of soda.

In another experiment made with commercial carbonate of ammonia, 1 gramme required 11 c. c. of normal acid to neutralize it. Therefore, 0.91 gramme would be equivalent to 1 gramme of carbonate of soda, or 2.4 c. c. of liquid ammonia, all of which will neutralize 10 c. c. of the normal acid.

To simplify the above proportion between the carbonate of ammonia and liquid ammonia, we demand how much liquid ammonia is equivalent to 1 gramme of carbonate of ammonia?

$\frac{gramm.}{NH_4O, CO_2}$	$\frac{c.c.}{NH_3}$	$\frac{gramm.}{NH_4O, CO_2}$	$\frac{c.c.}{NH_3}$
0.91	∴ 2.4	∴ 1	∴ 2.6

Therefore, 1 gramme of carbonate ammonia is equivalent to 2.6 c. c. of liquid ammonia.

How much carbonate of potassa is equivalent to 1 gramme of carbonate of soda?

$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{KO, CO_2}$	$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{KO, CO_2}$
As 53	∴ 69	∴ 1	∴ 1.032

Therefore, 1.3 gramme KO, CO_2 will be indicated by the same quantity of normal acid as 1 gramme of carbonate of soda.

* Read before the Photographic Section of the American Institute.

How much caustic potassa is equivalent to 1 gramme of carbonate of soda.

$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{KO}$	$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{KO}$
As 53	∴ 47	∴ 1	∴ 0.87

How much caustic ammonia is equivalent to 1 gramme of carbonate of soda?

$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{NH_3}$	$\frac{gramm.}{NaO, CO_2}$	$\frac{gramm.}{NH_3}$
As 53	∴ 17	∴ 1	∴ 0.32

That is to say, 0.32 NH_3 will neutralize as much normal acid as 1 gramme of NaO, CO_2 ; but the commercial ammonia contains a great deal of water which you can determine by the specific gravity of the liquor.

ARTIFICIAL LIGHT.

BY JAMES MARTIN.

A short time since I observed in a leading provincial newspaper a notice of a new light to be used for photographic purposes, of which I have not observed any mention as yet in the News. It was said to be produced by the combustion of phosphorus with nitrate of potash in such a manner that as the phosphorus burns the nitre melts, and, thus giving out its oxygen, produces a very powerful and actinic light. If this really be an accomplished fact, and not a newspaper canard, the light will be equivalent to what was called in old times, by chemical experimenters, the sun in a bottle, produced by the burning of phosphorus in a bottle of oxygen gas. Its production would become much simplified if it could be produced in the manner stated.

Thinking that some of your readers might like to experiment in this direction, I offer a few hints and precautions for their guidance, feeling assured that if such a light can be produced in a simple manner, it will afford a great boon to photographic art, especially as it could be afforded at a very cheap rate. Phosphorus is sold by chemists in the form of what are called sticks, being pieces about the size and shape of a blacklead pencil. It can be cut with scissors. It inflames at a very low temperature, and, therefore, must be kept under water. Great care must be taken that none of it gets beneath the finger-nails, or it will cause very painful wounds. All experiments with it should be performed in the open air. It is soluble in warm olive oil, and in the proportion of a drachm to an ounce of oil forms what may be termed phosphoric oil; an ounce of which, kept in a four-ounce white glass bottle, will, on removal of the cork, afford quite sufficient light to tell the time by a watch in a dark room. It is harmless externally, and may be written with, or even applied to the skin, without danger. Thus its pale lambent light may be made the source of much wonder and amusement.

Nitrate of potash is sold by grocers and chemists in the form of crystals, also in small cakes and balls. It is too frequently largely adulterated with common salt. This may be detected by dropping a little of the article into a solution of nitrate of silver, when, as your readers will know, if common salt be present, the silver will be thrown down in the form of a chloride. Nitrate of potash is easily melted at a low heat, and can be cast in any shape required.

The experiment I should suggest would be to cast a cylinder of pure nitrate of potash, having a bore down its centre of such a size as easily to admit the insertion of a stick of phosphorus. The whole affair would appear what might be termed a phosphorus candle, the phosphorus representing the wick, and the nitrate of potash the tallow; and I should think that they should be in about the same relative proportions. This can only be determined by experiment. Only an inch or so in length should be tried at first. Place the candle thus prepared in a capacious earthen pan, so that if any burning particles be thrown off they may do no damage. Ignite the phosphorus, and note the result.

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THE CARBON PATENTS.

COMMUNICATIONS from various quarters reach us asking for information or advice as to the effect of the approaching expiry of Mr. Swan's carbon patent now held by the Autotype Company. Reference to the matter may at first sight seem premature, as nearly twelve months must elapse before the complete period of the patent has run, and even then there is the possibility of a renewal. As most of our readers know, the full term for which the protection of letters patent can ordinarily be obtained is fourteen years. The first grant of protection is for three years. At the end of this time, on payment of a further fee, the protection is extended for four years more, making seven years from the first date. At the end of seven years, on payment of a further fee, the protection is extended for seven years more, making fourteen years in all. At the end of this period the invention, as a rule, becomes the property of the public. But in certain cases a further renewal or extension of the protection is possible, although it is very rarely obtained. The ground of application for such further extension is generally the alleged fact that the usual time—fourteen years—has been insufficient to permit or secure a return for the capital invested in the commercial launching of the invention. The machinery for granting this extension is somewhat cumbrous. At one time an Act of Parliament was necessary. Now it may be effected by petition to Queen in Council. The application for renewal is made to the Queen, who refers it to the Judicial Committee. The grounds for the application are heard before this Committee, before whom, also, any opposition may be brought and supported by evidence. If a good case is made by the applicant, he may, if the Committee regard his request as not in opposition to public policy, gain an extension of seven years more. The benefit of this power of prolongation was extended, by the fourth section of 7 and 8 Victoria, c. 69, to the assignee of a patentee. The assignee is permitted to apply for extension, although he stands in a less favourable light before the Committee. If he have, however, furnished the inventor funds which have enabled him to complete his invention, this will be regarded as a favourable element in his claim. The proceedings in an application for prolongation commence by inserting advertisements in the public press giving notice of such application. And persons wishing to oppose are entitled to enter a caveat, and to be heard by counsel before the Committee. Where the grounds of opposition are considered by the Committee as frivolous, costs may be given against them. But the costs of such an application for renewal, both to the patentee and opponents, are generally heavy.

A circular letter just received from the Glasgow Photographic Society informs us that they last year appointed a committee to use all means in their power to prevent a

renewal of Swan's patent, should an attempt be made to secure its extension; and the Society has recently appointed another committee, apparently with a similar purpose. It is to watch and take necessary steps, and to communicate with other societies, seeking their co-operation in such opposition. If the necessity arose, something more than the goodwill to oppose would be necessary. As opposition to an application for extension of patent could only be heard through counsel, somewhat extensive funds would also be necessary. Without any private information regarding the intentions of the present owners of the patents, we do not apprehend that there is much probability of an application for the extension of the patent in question, inasmuch as the prolongation of the monopoly at present enjoyed by the Company is already protected by other patents having several years to run.

Swan's patent was dated February 29th, 1864, and will expire at midnight on the 28th of February next year. As most photographers know, its protection covered a certain manufacture of tissue, and a certain mode of operating. The same kind of tissue suitable for transferring is still used, but the mode of working has been superseded. The use of paper coated with india-rubber for transfer purposes has been superseded by Mr. Johnson's method of mounting on an impervious surface without the aid of cement of any kind; and as this method was patented in 1869, and is universally employed, the possession of the patent for this mode of working continues to the Autotype Company the sole possession, practically, of carbon patent rights in this country. The expiration of Swan's patent will put an end to their exclusive right to manufacture tissue, but their power to insist on the use of their tissue will remain as a condition of permitting the use of their other patents. For, we should add, that besides the patent for the cardinal principle upon which carbon printing is worked, the Company possess several auxiliary patents—some for modes of preparing tissue, transfer paper, &c.—as well as the Lambert patents. Even apart from legal protection, only to be secured by costly proceedings, a company in possession of the field, possessing all the advantages of precedence, experience, and prestige, is manifestly in a strong position, and, happily for photographers, it has always manifested a disposition to exercise its powers liberally, and wisely to disarm antagonism by rendering it not worth while to maintain it.

Amongst the numerous questions which have reached us on this subject, we print one on another page in which an enquiry is made in reference to an announcement in an advertisement offering to teach the Lambertype operations, and stating that no license is necessary. We are asked if this is the fact. We can simply state that Lambert's processes are patented, and that, being so, they cannot be worked without license from the owners of the patents. If we are further asked as to the validity of those patents, we can simply reply that a satisfactory answer can only be gained when a case is presented for the consideration of the Vice-Chancellor. If our correspondent ask if such a decision is likely to be invoked, we think he will learn from the Autotype Company that they will have no hesitation in seeking it in case of ascertained infringement.

We do not here enter into any discussion of the observations of some of our correspondents on the obstructiveness of the carbon patents. We are bound to say, from a careful consideration of the facts, that carbon printing has been advanced rather than obstructed by the existence of the patents. The existence of Swan's patent was no barrier to the improvements in Johnson's and subsequent patents. And the existence of a patent rendering possible some compensation for labour, rendered men like Swan and Johnson able to devote years of time, occupied in constant experiment, to rendering practical a process so desirable, yet so hedged round at the outset with difficulties.

SCIENTIFIC CLOUD PHOTOGRAPHS.

THE Astronomer-Royal for Scotland, Mr. Piazzi Smyth, whose photographic operations inside the Pyramids may still be remembered by many of our readers, proposes that a meteorological record should be furnished by photographing the formation of clouds. Mr. Smyth believes that a systematic depiction by the camera of the cloud formations from time to time would be of considerable use as an addenda to other meteorological results, and would aid in arriving at more conclusive results.

To carry on such work, it would be necessary that the meteorological station should be well removed from the murky atmosphere of a town or city, for Mr. Smyth has found that experiments conducted at the Royal Observatory at Edinburgh are materially influenced by interrupting causes of this nature. During the past two years he has experimented at Edinburgh, "in the few and far between opportunities which the almost eternally smoky climate of a great city permit;" and the results he has obtained confirm him in the belief that matter of scientific interest would be afforded by prosecuting the work still further. The Astronomer-Royal for Scotland has succeeded in "photographing clouds with sufficient definition and rapidity to secure much of the detail of their structure, though in rapid current motion and organic change at the time;" and by having recourse to some new arrangements of the optical, chemical, and mechanical parts of his apparatus, he has obtained results "which are probably well worth preserving and publishing."

One particular series of cloud photographs Mr. Smyth mentions as being particularly noteworthy, having been taken during the progress of an eclipse. He tells us that the effect of the eclipse upon the formation of clouds is very clearly shown in photographs, the phenomenon "altering the physical constitution of the earth's clouds for the time being;" a circumstance that "was abundantly, and even grandly, manifested on the photographic plate."

FRENCH CORRESPONDENCE.

M. JANSSEN'S PHYSICO-ASTRONOMICAL OBSERVATORY RECOGNISED BY GOVERNMENT: ITS INSTALLATION AT THE CHATEAU DE MEUDON—A MONSTER DARK ROOM—BLISTERS IN ALBUMENISED PAPER AVOIDED BY AN ALCOHOL BATH—PHOTOGRAPHY AND THE POLICE: EXTENSION OF THE PHOTOGRAPHIC STAFF AT THE PARIS PREFECTURE.

SOME months ago I gave the readers of the PHOTOGRAPHIC NEWS an account of the physico-astronomical observatory which M. Janssen had established at his own expense at Montmatre on a height overlooking Paris. It was only a provisional establishment, a veritable scientific camp, in fact. Indeed, the eminent astronomer, whose name is as well known in England as in France, had merely rented a piece of waste ground, and had there set up the barrack and outbuildings which had served him in Japan, at Nagasaki, at the time of the observation of the Transit of Venus, and which he had taken care to bring back with him. The apparatus at his disposal was new, and well adapted to astronomical purposes, for it had been specially purchased for the Transit of Venus observations; and M. Janssen has made therewith observations of a most important and useful character, the *revolver photographique*, his own invention, being of particular value. Among other things, he commenced here, at Montmatre, to record the history of the sun's disk, taking daily a series of pictures representing phases of the solar orb. I have already spoken of these pictures, which are taken with such precision and of such a size as to render their study exceedingly facile.

An enterprise of this description, the value of which from a scientific point of view must be apparent to all, could not obviously remain in the charge of a single man, and one day or another it was evident Government would be compelled to come to the assistance of the astronomer, especially as the work partook of a national character. The day was not very long coming, for at the end of last

year the observatory was officially recognised, and M. Janssen was nominated director of it. Moreover, the Parc de Meudon was definitely assigned to him for setting up the establishment in a proper and adequate manner. It would be difficult to find a more eligible site than that now decided upon. The fine chateau, which visitors loved so to visit in their excursions around Paris, was burnt at the time of the war, and of it there now remain but the four walls and the magnificent terrace, which has before it a vast panorama of the Seine and the Bois de Boulogne. This terrace seems designed expressly for a platform whence to undertake the exploration of the heavens. Hither M. Janssen has transported his encampment, awaiting the moment until the chateau which is to be fitted up for his work shall be ready to receive its new master.

This week I had the pleasure of visiting the new domain of the eminent astronomer, and I saw, among other things, a large dark room, the interior of which was fitted up as a series of photographic laboratories, arranged with a good deal of ingenuity. The building is of brick, with an acute roof, and has something the aspect of a barn. Inside are partitions of wood reaching half way up, and forming two rows of separate cells, separated by a corridor, into which they all open. Each compartment is illuminated by a window of yellow glass, and there are proper washing arrangements and places for draining the plates, racks, &c., in all of them. The interior of the barn-like building is painted from top to bottom in yellow, and two little yellow doors, one on each side of the building, permit of the entrance and exit of persons without inconveniencing any work that may happen to be carried on. The air warmed by a stove circulates freely above the compartments, and imparts an agreeable temperature throughout. It will be seen from the above that the room is provided for a large staff of assistants, and we may mention that the Observatory will be, besides a post of observation, also an establishment for the instruction of students, who will be able to follow all the operations as they are carried on. All the apparatus which we saw in working order at Montmatre are here set up again, under canvas or wood, upon the Meudon Terrace, and the regular work of the establishment is now resumed after a pause occasioned by the removal. But, as we before remarked, the situation is still only temporary, and the reconstruction of the chateau will forthwith be commenced. When complete, the physico-astronomical laboratory of M. Janssen, which he has taken so much pains to establish, will be one of the most charmingly situated of all scientific establishments.

For some time past complaints have reached me of blisters in albumenised paper during the operation of washing which follows the fixing of positive prints. A provincial photographer, M. Andr  s, has now communicated to me a simple method, which is at the same time an inexpensive one, thanks to which he has been able for some time past to counteract the defect in question. This is the plan he recommends. You pour into a bath some rectified spirits of wine and distilled water in equal parts. After the first washing operation, which follows the toning, the prints are plunged into this bath, which may last a long time; an immersion of five minutes suffices, and then the paper will be seen to be more transparent. At the same time the image assumes a grainy look; but about this one need be under no apprehension, for the appearance will gradually disappear. On coming out of this alcohol bath, the prints should be washed once only, and are then fixed and finished in the ordinary way. To convince oneself of the good effects of this alcohol bath, it is only necessary to plunge the half of a print upon a sample of doubtful paper; it will be seen then that the half that has been dipped into the alcohol bath is quite free from blisters, while the other portion will be attacked by these.

About a year or eighteen months ago I announced, in

one of my letters to the PHOTOGRAPHIC NEWS, the formation of a photographic service in connection with the Prefecture de Police at Paris. Till then, such work as it was necessary to execute for police purposes was undertaken by professional photographers, but, as may be imagined, such a course was found often to be inconvenient, and one or two officials who had some knowledge of photographic manipulation were induced to discharge such duties. They were provided with a laboratory, such as it was, at the Central Police Station of Paris, and notwithstanding many points of an unfavourable character, the staff managed to render some valuable services. Today the photographic department of the Police has been greatly enlarged. As soon as a crime is discovered, the body of the victim is at once photographed, and if it cannot be identified, hundreds of prints are produced of the negative, and distributed in every direction, while the remains themselves are taken to the Morgue. If the guilty is known, and has taken flight, his portrait is procured if possible, and this is also reproduced for distribution; if but suspicion point only to a certain party, the same steps are taken. It is in this way that the Police have of late taken measures which have proved successful in the case of a terrible crime that has resounded throughout Paris for the last month. The services rendered by the photographic staff of the Police in the notorious instances of Billoir and Moyaux have added much to its prestige, and the Prefecture is now about to make more extensive arrangements so as to make further use still of the camera. So far have they gone as to make experiments with a process which enables one to send a portrait by telegraph, in the same way as an ordinary message. I shall return in a future letter to this interesting subject.

ERNEST LACAN.

THE RETICULATION DIFFICULTY.

BY W. E. BATHO.

RETICULATION in carbon prints has occasioned, and will occasion, discussion in reference to its cause and cure. I need scarcely point out that the knowledge of the one does not imply that of the other. You may know the cure without being able to state why it is such, or again the cause, and not be able to suggest a remedy. As this defect "is peculiar to pictures developed on collodionized glass," it seems at least irrational to seek for remedial measures among remedies having no relation to the before-mentioned circumstance. That the defect is a purely mechanical one seems very probable when the simple substitution of a flexible for a rigid support at once removes the evil. In the Company's Manual, the following are given as some of the causes of the defect. First. "The tissue dried too quickly." Second. "The use of a too neutral solution of bichromate of potash." Third. "The collodion not suitable." Fourth. "The tissue allowed to become too limp."

The first of these causes seems to me to depend upon very debatable ground. I have reasons to know that upon several occasions M. Lambert dried his tissue very rapidly, and produced therewith pictures of as fine a quality as can be obtained with the recognized methods. In my own case, with such materials as are at hand at home, I have dried tissue in under two hours, the conditions being a good current of air, and a considerable variation between the wet and dry bulb, showing a dry atmosphere; while such tissue was not so sensitive as another dried slowly, prints were produced therefrom having no trace of the evil complained of; indeed, it is but a few days since I sent two prints produced with these tissues to a friend in the States, one half of each being reticulated, and the other half quite free therefrom. Such diversity in the same prints was produced by the method of transfer employed, hence it does not follow that quick drying gives reticulation, or slow drying an absence thereof.

En passant, I would mention that the use of alcohol to enable tissue to be dried with greater speed is no new in-

stitution, being now nearly ten years old; it is recorded in your volume for 1868, page 497. The method there indicated I have occasionally used, and have overcome the difficulty of the decomposition, indicated by poor keeping qualities, with a liberal dose of ammonia. It may not here be out of place to put on record a circumstance I think I am first to observe, viz., that insolubility of bichromatized gelatine upon exposure to light is not produced when conditions are brought about in which moisture is perfectly excluded.

The second cause of reticulation as given, is "the use of a too neutral solution of bichromate." If by this is meant the use of a solution not acid enough, I may say I have never yet found an alkaline state of the sensitizing bath produce any injurious effects. It was once said to me that it caused decreased sensibility, indeed, to an alarming extent. I have never found it so, and in support of this view may quote M. Lambert, who says, "The more ammonia you put in your sensitizing, the quicker the printing" (see *Philadelphia Photographer*, December 1876). Still I don't think this, but simply that it has no effect on reticulation or sensibility.

The third item—viz., unsuitable collodion—without doubt touches the cause of reticulation in its most vulnerable point. I have reason to know that a support interposed between the exposed tissue and its rigid support of an elastic nature prevents the evil.

The fourth really means the tissue is in too expanded a state. This would also be overcome by the method indicated in treating of the third cause.

In conclusion, attention may be drawn to the varieties in tissue. For the Autotype Company to say all their tissue sent out is good and fit to produce the best work for which they are intended, is simply at variance with fact. No doubt every care is taken to produce uniformity of result, but they do vary, and hence cannot all be the best. The change brought about in gelatine with boiling or continued heating must bring about corresponding varieties in tissue, and certainly is a circumstance not to be over-looked by photographers.

It unfortunately seems to be becoming a practice to snub the labours of "outsiders;" but it may be aptly said, such treatment with the carbon process would betray a vacuity of mind that might well and wisely be made a store room for the history recording the labours of those pioneers upon whose brain-work as a foundation the carbon process of to-day stands firmly erected.

Correspondence.

CARBON PATENTS.

Glasgow Photographic Association.

SIR,—The Glasgow Photographic Association have had under consideration at various times the question of carbon patents. Last year they passed a resolution to use all the means in their power to prevent the renewal of Swan's patent, should any attempt be made to have it renewed.

This year the Association have again had the subject under consideration, and appointed a committee to watch and take any steps necessary; also to communicate with other societies, asking their advice and co-operation.

The committee would now respectfully solicit your advice and co-operation, and will be most happy to hear what your views are, and if you will lend your countenance and support for the object indicated.

Swan's patent expires in February, 1878; its claims are 1, The preparation and use of coloured tissues; 2, The mounting of undeveloped prints obtained by the use of the coloured gelatinous tissues; 3, The re-mounting or transferring of developed prints produced as above described from a temporary to a permanent support.

It may be taken that this patent, or the principle of it, is the backbone of carbon printing as at present practised

(although there are doubts as to its originality); but the patent being removed, the great obstacle to the use of the carbon process and the manufacture of the tissue would be taken away, thereby cheaper and better tissues may be expected to be introduced, and other improvements made in the process.

We believe the licensees, and all others practising photography, are interested that this patent be not renewed.

Our committee will be greatly obliged by you or your Society sending an answer at your earliest convenience.—Yours respectfully,

ALFRED ROBERTSON, Hon. Sec.

37, Glassford Street, Glasgow, March 24th.

[The above letter, although forwarded to the Editor, is manifestly one sent round to individuals and representatives of photographic societies.—Ed.]

SIR,—I was in Glasgow last week, but too late for the Association meeting. It seems there was a great discussion on that inexhaustible topic, the Autotype Company and their patents.

The little photographers and tintypers about the Broomielaw are labouring under the hallucination that they are groaning under an unjust and unlawful monopoly, and that the Autotype Company are "seriously impeding and hurting the advancement of the art." Mr. Urie is the leader of this little band of knight errants. "I produced pictures in carbon twenty years ago, and could do so again. I produced better carbon prints than those of Paton's, and I never saw Lambert," were the remarks of Mr. Urie. The discussion resulted in a committee being appointed "to oppose any application for the renewal of Mr. Swan's patent by the Autotype Company, and to confer with other societies in order to elicit their sentiments, and secure their co-operation."

The spiritualistic proclivities of some members of the Glasgow Association, and the pronounced scepticism of others, is well known, and at an adjourned meeting of this vigilance committee an unexpected scene took place which teased the sceptics and pleased the spiritualists. In conversation Mr. Urie's manifestations of a former meeting were adverted to, which brought a cloud upon the brow of Mr. B——, who at once sent for the medium Duguid, soliloquizing, the while, "This is the night which makes me or for—does me quite."

On the arrival of the medium the gas was turned down, and he having gone through the usual shiverings, the orthodox rap was the sign that questions might be asked. The spirit of every departed carbon experimentalist was called in succession, and all declared that they "detested patents"; all declared that the committee would be successful. Mr. Urie asked "if they might look for any hope of reducing the patents of Johnson, Sawyer, and Lambert?" Whereupon the medium spoke, in a foreign tongue, "*Dabit Deus his quoque finem*." No one understood it, and, in explanation, Duguid said "it was the Abbé de Laborde who spoke, but as he was displaced by another spirit, he could not get a translation." Mr. Black, the veteran artist, said it was "nonsense listening to a French Father speaking in Latin," and rose to go. At this juncture the medium seemed to be wrestling against the spirit who had displaced the Abbé, and, however unwillingly, gave utterance to the following in good English: "I am John Taylor." Here Mr. Urie protested against listening to Taylor, "as he was before the days of carbon printing, and knew nothing of Swan's patent." With much persuasion he was calmed down, so the spirit went on uninterrupted: "I am John Taylor. I know nothing of pigment printing, but something of patents, particularly an alto-relievo patent, for exhibiting specimens of which I had to pay the piper, and as funds are wanted by the committee here met, I ask Mr. Urie to operate on the piper."

This report was given me as genuine, but I suppose your readers must take it *cum grano salis*.—Yours truly,

JO. VANTAM.

DEAR SIR,—Surely a Scotchman can be no longer the "cannie Scot" of old times, or the Glasgow Photographic Society must not be taken as representing the intelligence and shrewdness supposed to be special attributes of our Northern friends. These gentlemen seem to have been holding an indignation meeting lately, and been "going in" against the renewal of Mr. Swan's patent for the manufacture and mode of using carbon tissue. Their secretary, too, has made some amusing researches into the history and modifications of the various Autotype Companies, beginning with Mr. Swan and ending with Messrs. Bird and Sawyer.

Now, if there had been the smallest spark of the national shrewdness amongst these gentlemen, they would, first of all, have made themselves acquainted with the facts—and the facts are these. Before the renewal of a patent is granted, the inventor (and no one else) must declare solemnly that he has received insufficient pecuniary benefit from his invention. Now, as Mr. Swan sold his patent to the Autotype Company for a large sum, it is perfectly impossible for him to do that, and no one else can. Verily these Scotch gentlemen have posed before their brethren in a paradise of ignorance, and their secretary wasted a good deal of time in getting up totally irrelevant matter, when he should have been making himself acquainted with the true state of the case, in order to be able to properly advise his Society. Such a spectacle will be edifying to all, but specially to

NEXSIS.

DEAR SIR,—I am very much puzzled at this time to know what is best to be done. I am desirous of replacing my silver printing by some more permanent method, and had almost decided to become a licensee of the Autotype Company, supposing a license was necessary; but this week I see an advertisement in your journal from a company who are on the point of supplying the tissue and other materials for the working of the process, and I also see that a firm at Barbiton offer to teach me the Lambert-type carbon printing process, and that no license is required.

I think, sir, in the interest of your readers, this matter should be somewhat cleared up.

I see the Autotype Company still advertise their licenses, and this week say that they decline to supply materials except to licensees; but if it be true, as I have been told on very good authority, that the materials can be bought in open market, this move of the Company's is not likely to be of much avail. Altogether, I am in a dead-lock. I think the Company have not been illiberal, and that the price they put upon their license is not ruinous, but nobody likes to pay without the necessity being shown; and if I can get all my instruction, work without a license, and buy my materials in the open market, I, for one, do not see the necessity.

Will you excuse my taking up your space in this matter? Of course, I might have written straight to the Company; but being unknown to them I felt disinclined to do so, and besides, this seems to be a matter that really requires to be explained for the benefit of all your readers.—I remain, yours truly,

J. ELLIOTT.

125, Liverpool Road, Islington, March 26th.

CARBON PROCESS FREE FROM RETICULATION.

DEAR SIR,—I send you a carbon process, perhaps a new one, free from reticulation and many defects, and also without expensive apparatus, such as press, frames, papers, &c. Proceed as follows:—

Coat a hard varnished negative with a stratum of gelatine, formed of

Gelatine	...	...	...	1 ounce
Glycerine	...	...	...	1 "
Water	...	...	...	10 ounces

Allow to dry. Flow with india-rubber solution or collo-dion; then allow to dry. Coat the negative which has a covering of gelatine and india-rubber with gelatinized

pigment solution, and then dry; sensitise in terchromate of potash and alcohol bath, or a mixture of gelatinized pigment, one ounce terchromate of potash or chromic acid, and three ounces of alcohol. Dry in drying box. Place the dried sensitized film on the negative on a piece of velvet, and expose, develop, transfer, and mount as usual.

DEAF AND DUMB ARTIST.

COLOUR OF CARBON PRINTS.

SIR,—It would seem that I had stumbled on to dangerous ground, where "Nemesis" follows fast upon my footsteps. I am disposed to think, however, that the "party" calling herself "Nemesis" is a Bogus article, and not the genuine daughter of Nox. It is as well to be civil, however, even to a pretended deity, and I will, therefore, endeavour to answer the questions which are intended to silence me. I am asked to show cause why the Lambertype licensees ought not to have the monopoly of information referred to, and ought not to preserve it secret, seeing they have made special payment for their licences. This question is intended to be a *poser*. It is, however, easily answered. In the first place, because a patent and secrecy are diametrically opposed to each other, and constitute, in fact, a contradiction in terms. The word patent implies "open," "spreading," as a classical deity ought to know. And the condition under which letters patent become a temporary protection to exclusive rights is, that the invention so protected should be openly described, so that an ordinary workman might put it in operation. I thought it was for the exclusive rights involved in this patent the Lambertype licensees paid. If these really are so shaky that they need to be bolstered up by the aid of secrecy, it is very unwise of those concerned to show it. There is on record at least one similar attempt in the history of photography, and, by odd coincidence, also in connection with carbon. One of the earliest and most enthusiastic carbon experimentalists in this country patented his discoveries, but also kept secret certain parts thereof, endeavouring to gain the cover of two forms of protection incompatible with each other, patent law and secrecy; and his career in this direction was unmitigated failure. I see it announced that one of the licensees, with rare good faith offers to teach all the operations for a consideration, and announces that no licence is required!

Well, I hope I have answered "Nemesis" as to why the Lambertype licensees should not make any claim to exclusive information, as well as exclusive rights to work the patent method. But the Goddess of Vengeance objects that I set up my "dictum as a standard of good taste." That is an error. I never did so. On the other hand, I limited myself to pointing out the fact that Lambertype purple was not a colour selected by artists for their monochromes, but that certain other pigments, easily available to carbon printers, were used by the recognized arbiters of taste. And so far from appearing not to know that pigment of this kind was supplied by the Autotype Company, I recommended it as especially accessible as well as pleasing.

"Nemesis" having attempted to defend the practice of secrecy by Lambertypists, next proceeds to deny its existence, and points out many useful articles in your own pages. Sir, I recognised that fact, and gladly say, all honour to the men who thus distinguish themselves, and maintain those traditions of photography by which its rapid progress has been made certain. Let the most exclusive of those anxious to retain the best methods of permanent printing in few hands remember that had such been the practice of the earlier experimentalists, carbon printing would not have been in its present advanced position.

The Autotype Company, who are now the holders of the Lambert patents, naturally enough wish to offer inducements to obtain fresh licensees, and, as I learn from the letter of "Nemesis," they offer special advantages as to price as well as quality of tissue. This is a commercial bargain, to which no one has a right to object; but the preservation of exclusive information, I venture to affirm, is impolitic, as

well as ungrateful to the earlier teachers. Just at this moment there are rumours and announcements of competition in the manufacture of tissue. Hitherto, the Autotype Company have maintained a reputation for liberal dealing, which is, I should think, worth keeping up. In an open competition their experience and good reputation must stand them in good stead, and help them to secure new as well as old customers. But if their name is associated with the preservation of secrets, and practically in antagonism with the mass of photographers, they then play into the hands of their opponents. In this case, the operation of natural, social, and commercial law will bring about a requital without calling up a Bogus "Nemesis."—Yours,

A CARBON WORKER.

MEDALS.

SIR,—I have read with great interest the letters in the two last issues of the NEWS, respecting the awarding of medals at Photographic Exhibitions. Without doubt it is a matter of much importance to photographers, and I think worthy of more attention than it has hitherto received. No one will deny the value of such inducements to photographers to exhibit: it would tend above all things to elevate the artistic standard of their work: stimulate a healthy competition in the place of the miserable commercial manner in which professional photographers too often conduct their business; and, finally, be a reward to those who by their study produced work which would raise the art in the estimation of all who saw it.

Of course it will be impossible to satisfy all, there are bound to be some heart-burnings at the result of the awards. There seems to be one great bugbear ever present in the minds of our brethren of the "Noble Order of the Bath," with regard to the giving of medals or prizes, and that is the fear of "favouritism" cropping up. Something should be done to remove this fear as much as possible, and I think if those most interested in the matter were to convey their ideas through the NEWS, &c., as to the best manner of doing so, those who have the management of exhibitions, by picking out the really practical suggestions, and adding some of their own, might arrive at a generally satisfactory arrangement, and photographers would then feel more confident that the *best work* will win.

With regard to photographers exhibiting medals bought, or, at any rate, not *won*, by them, I think such doings both mean and contemptible. No man of right principle, or the smallest honour, would stoop to such tricks, and the only consolation others can have is in the fact that it is a *proof* he has no artistic merit of his own, or he would not find it necessary to use other people's laurels in order to induce the public to expend their money, and afterwards their ire, upon him. It is a pity that even such paltry tricks as these cannot be stopped, so that in every case those should obtain

HONOUR TO WHOM HONOUR IS DUE.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on Thursday, the 22nd inst., at the Free Library, William Brown Street, the Rev. H. J. PALMER, President, in the chair.

The minutes of the previous meeting were read and passed.

The SECRETARY read a communication from Mr. Ellerbeck, in which that gentleman stated that since he read his paper at the previous meeting he had received from Mr. W. B. Woodbury a packet of his transfer paper, and found it admirable for the removal of negative films from ferrotypes and glass plates. Mr. Woodbury recommended, after the immersion of the film and paper under water, to squeeze the two, and leave them for half-an-hour; then, while still damp, to remove the paper negative. Mr. Ellerbeck found this not possible in the case of metal, the collodion adhering strongly to the iron; but if the whole were thoroughly dried, and, if necessary, heated, a knife passed under

the paper separated the whole at once, and without the slightest difficulty. Care must be taken to have the ferrotype surface clean, otherwise a portion might remain in minute spots, which could only be removed by using ether.

The SECRETARY exhibited several transparencies toned with chloride of palladium. These were considered excellent, and the tone very satisfactory. They had been prepared by a solution of two grains of palladium to one ounce of water; but Mr. Ellerbe thought a weaker solution would do.

The PRESIDENT exhibited some sheets of gelatine made thicker than usual, which he found very suitable for using as substitutes for glass to coat with gelatine emulsion. He (the President) had been using, for the purpose of coating, a simple apparatus which, as they would see, was merely a sheet of tin doubled like a sheet of note paper, the upper half having an opening a little less than the paper or gelatine to be coated, and, being bent a little outward, forming a spring when the two sides were pressed together, and for convenience clipped with the paper between; the emulsion could be easily spread with a glass rod, the paper lying perfectly flat. The tin holder should be slightly warmed before coating with gelatine. He (the President) also exhibited a folding three-sided lamp shade, one side having an opening covered with non-actinic gelatine.

Two portrait negatives of the President were shown, which had been kindly exposed by Messrs. Brown, Barnes, and Co., at one of their studios—one on a collodion plate, and the other on a gelatine plate prepared by the President. The former had an exposure a fourth longer than the gelatine; the result was slightly in favour of the wet collodion plate.

The PRESIDENT then proceeded to give a practical demonstration of Mr. Leach's enlarging process, which was watched by the members with the greatest interest.

The meeting was shortly afterwards adjourned until April.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on Wednesday, the 14th inst., Mr. J. J. Leno in the chair.

The minutes of the previous meeting were read and approved, and two new members elected.

The CHAIRMAN having asked if any of the members present could tell him what was the best film for microscopic work, granularity or structure of any kind being what he wanted to get rid of,

Mr. SMITHILLS expressed his opinion that the collodio-bromide emulsion with alkaline development would prove extremely suitable, and would give little texture or granularity.

Mr. ROBERTSON (secretary) then read a communication from Mr. John Urie (see page 147).

The SECRETARY said that after he received Mr. Urie's letter he thought he would take a look at the Autotype Company's advertisements. Although unable to find any Autotype advertisements in 1868, he might not be far wrong if he noted "A Carbon Process on Mica," by M. Despaquis (six sheets for six shillings), and a book by Mr. G. Wharton Simpson on "Photography in Pigments"—a work containing a full account of Swan's carbon process, price seven shillings and sixpence. If the Society or any of the members had a copy of this work he would like to see it. In 1869 the Autotype Printing and Publishing Company, Limited, announced that they were the sole proprietors of Swan's patent for printing in carbon; they granted licenses to use the patent process in consideration of an annual payment of ten pounds, and they cautioned photographers against pretended improvements of the process which were mere colourable infringements, against which it would be the duty of the Company to protect their interests, and those of their licensees. In 1870 the Company gave, gratuitously, practical instruction in carbon printing. The purchase of the apparatus and material included the right to use them without license. In 1870 Mr. J. A. Spencer said he had recently erected machinery for making pigmented gelatine paper as employed in the processes of Poitevin, Fargier, Blair, Pouncy, Edwards, &c. In 1871 the Autotype Fine Art Company, Limited, advertised a sensitive pigment paper; also their new pigment paper. Licensees had the right to use Swan's patent, Johnson and Edwards' patent, instructions being given gratuitously. In 1872 the Company gave a list of their directors, &c. Among these Mr. Spencer's name was found. In 1873 the Autotype Fine Art Company, Limited, announced that the exclusive rights in their patents, together with the factory, works, and plant at Ealing Dene, had been sold to Messrs. Spencer, Sawyer, Bird, and Company, and that they would receive

orders and grant licenses. In 1876 Messrs. Spencer, Sawyer, Bird and Company announced that they had purchased the goodwill and copyrights of the stock-in-trade, and lease of the gallery, late the property of the Autotype Fine Art Company, and their advertisement contained M. Lambert's tissues, presses, and materials for licensees. In 1877 the Company showed a registered trade mark. They dropped the title of Spencer, Sawyer, Bird, and Company, but had the single name of the Autotype Company; and they effected important modifications in the manufacture of pigmented tissues. In January, L. Lambert was announced as having engagements for Canada and the United States, and M. Lambert, jointly with the Autotype Company, would give a reward of £200 to any person who, without using their patents or materials, would produce in the same length of time the different styles of portraiture, permanent and artistic, obtained by the Lambert process. The last advertisement announcing the silver medal award seemed to adopt the name Edinburgh people gave them—the London Autotype Company. He did not know whether these jottings were of any use, but was inclined to think there was some interest and instruction in seeing the changes and development of the Company. He thought it might be said it originated with Mr. Swan, of Newcastle, and after many changes seemed to be the property of two men—viz., Messrs. Bird and Sawyer.

Mr. GILLILLAN said he believed a committee had been formed last year, when the notice of expiry of patent was first pointed out by Mr. Urie, their duties being to correspond with other societies and ascertain their sentiments on this important matter; but the committee had seemingly omitted to take proceedings, and he now proposed that the Society should come to the conclusion to raise objections to the renewal of the patents.

Mr. URIS thought, with Mr. Gillilan, that the movements of the Autotype Co. should be watched, and when it was found they made an application for renewal, objections should be raised.

The CHAIRMAN said it would be better to ascertain the sentiments of other societies before proceeding further.

Mr. JOHNSTON then read a paper on "Organic and Inorganic Matter: their Use in Bromide of Silver Emulsions" (see p. 148).

The SECRETARY then drew attention to a number of photographs (exhibited by Mr. George Mason) by M. Klayr, of Algiers, which would show the members the effects to be obtained by his so-called "improved mode of lighting;" also, some more specimens by Mr. Paton in further development of his imitation of M. Karelne.

Mr. PATON said that at the previous meeting he had stated that in order to prevent his white window curtains from coming out a mere mass of white, he had recourse to colouring them slightly with orange chrome; but he now found that to be wholly unnecessary, as, by putting the dark background which formed the sides of the window, they were easily photographed so as to come out quite distinctly.

Mr. GEORGE MASON pointed out that Mr. Urie was of opinion that the patent the renewal of which was under discussion was not a valid one, and the Autotype Company, according to his statements, could do him no harm if he persisted in working in carbon, despite the Company; and if such were the case, why should the Society be asked to fight against nothing? Those who were not patentees, and wished to work in carbon, but objected to paying any royalty, and were as confident as Mr. Urie that they could not be restricted, should at once set to work with the process in defiance of the Autotype Company.

Mr. URIS replied that, though not fearing the result, the mode of procedure referred to would likely cause any artist, personally, a considerable deal of trouble, and possibly expense, and therefore thought the course he advocated—viz., the formation of a committee, and the appeal to kindred societies for help and support—the better plan.

Mr. DONDS stated that Mr. J. A. Spencer, late of the Autotype Company, had himself, before he became a partner, held that the patents were not valid, and no restrictions could be placed on his working the carbon process, which he had proved by practising it for a considerable time in spite of the Autotype Company's attempts to stop him.

Mr. MASON said Swan's patent—the one under discussion—was a single transfer process, and could not harm those who were Lambert's patentees, seeing theirs was the double transfer.

Messrs. URIS and DONDS declared that both single and double transfer were included in Swan's patent, the only thing (Mr. Urie further pointed out) being that Swan did not claim the use of unsensitized paper or tissue in his provisional specification, his

mode of working it being the pouring of the collodion and carbon on a sheet of glass, and stripping the film off, ready sensitized.

Mr. GILFILLAN moved that a new committee be appointed to oppose any application for the renewal of Swan's patent by the Autotype Company, and to confer with other societies in order to elicit their sentiments and secure their co-operation.

The motion having been seconded by Mr. McPherson, Messrs. Bowman, White, Urie, Smart, Bell, and the Secretary were appointed.

The Chairman said he believed the idea was a good one, and could see, with Mr. Urie, that carbon printing would receive a great impetus, and its advancement be materially affected, if the patent rights could be got rid of.

Mr. Mason drew attention to the somewhat anomalous conduct of the gentlemen who were advocating resistance to the renewal of patent rights to the Autotype Company, in so far as for many years they were quite at liberty to work the carbon process, if they chose, without paying any royalty; but seemingly none, or at least very few, of them availed themselves of the liberty. To them it existed as a scientific fact alone, as of commercial value it was nowhere; but immediately Mr. Lambert appeared, and, by paying a royalty or buying the right, a few of their neighbours got an advantage over them, they seemed to be suddenly awakened to the fact that as a commercial speculation the carbon process was likely to prove a success, and longed for the liberty they once had, but thought right if until it was taken from them.

The Secretary stated that he could not see what M. Lambert had to give in return for £30.

Mr. Paton said that, after having seen M. Lambert work, and the exceedingly beautiful results obtained by the process, he had bought up the right for his particular district. Unlike his other patent purchases, this one had proved a commercial success, although he had previously known nothing at all of carbon printing. M. Lambert had enabled photographers, by his improvements and modifications, to produce small carte work in carbon, which before was almost exclusively used for work of a large size. He believed there were some men here and there working the carbon process without paying for a licence, but those had got the liberty from the Autotype Company before M. Lambert had come to the front, but still the materials those gentlemen obtained were not at all to be compared for excellence with what he (Mr. Paton) got, and, further, small work was beyond them. He felt quite satisfied with his purchase, and considered he had got an adequate return for his money.

Mr. Mason also explained that Lambertaines were altogether different things from the usual productions of the Autotype Company, and that those gentlemen of whom Mr. Paton spoke had been workers in it for many years, having, when they first purchased their materials from the Autotype Company, obtained the right, the Company at that time granting the liberty to those who purchased the materials from them.

Mr. Urie stated positively that he had produced pictures in carbon fifteen or twenty years ago, and could do so again. He had placed on the table, last season, pictures quite equal to those now produced by Mr. Paton, although he had never seen the Lambertaine process worked; and now, because he had not purchased his materials from the Autotype Company, and objected to paying the holders of Lambert's rights the sum demanded, he was debarred from using the process or improved materials. Mr. Paton had stated that he did not know anything about carbon printing until instructed by M. Lambert, for which lessons he paid a considerable sum. But what was he (Mr. Urie) to get in return for his money when he knew all about the process already? Was it only that better materials would be supplied by the Company? They were not asking to work Lambert's patent. All they wanted was to prevent the renewal of an old patent that had run its legal term of fourteen years.

A vote of thanks to the Chairman, closed the meeting.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place on Tuesday evening, April 3rd, instead of the usual second Tuesday in the month, at eight o'clock, at the Gallery, 52, Pall Mall East, when the adjourned discussion on the "Silver Bath," opened at the March meeting by Mr. John Spiller, F.C.S., will be resumed.

TRADE CATALOGUE.—Mr. R. C. Thomas has just issued a new catalogue of photographic chemicals and other appliances for the photographer, which he has in stock. It is an amazingly complete repertory of photographic requisites, which we commend to the attention of our readers.

CRUICKSHANK IN SPAIN.—An interesting paper was recently read by Mr. S. Flint (Clarkson), at the Architectural Association, based on the photographs taken by Mr. J. C. Steuning and Mr. John MacAndrew, of early churches in the Asturias.

To Correspondents.

IRON.—The most common cause of similar streaks, in our experience, is the formation of a surface scum on the bath, which should be carefully removed by drawing strips of clean blotting-paper over the surface before immersing a plate. In some cases streaks may be prevented by keeping the plate in lateral motion whilst it is in the bath.

T. B. R.—Judging from your statement and the piece of stained paper you enclose, you have not read or understood the instructions for working the carbon process. The dark side of the tissue must, of course, be placed in contact with the face of the negative, and then the same dark side be placed in contact with the glass or transfer paper, whichever you use for developing on. Carefully read the instructions given in many articles in our columns, or obtain the Manual of the Autotype Company, and follow the instructions.

NIL DESPERANDUM.—There are no definite rules of the trade yet established. It is too young a trade to have any definite or recognised laws in such matters. All such matters are generally subjects of special agreement, and where no agreement exists the master generally decides on his own judgment, or convenience, or estimate of fair play. An observant apprentice may constantly be learning something, in whichever department he may be employed, but one year in the operating department to six in the printing department gives certainly some excess to the latter.

J. W.—Make a 32-grain bath with pure distilled water for negatives; a 60-grain bath made with tap water for prints. Proceed much in the same way as in producing collodion positives, giving, however, a little longer exposure, and continuing the development much longer. Sensitive paper may be kept in good condition some time if placed between sheets of blotting-paper which have been immersed in a solution of carbonate of soda and dried, as described several times in our pages. The toning bath, if carefully kept from contact with dirty fingers, or other causes of contamination, may be used over and over for many batches of prints, but fresh hypo must always be used for each batch.

WELLINGTON.—It is not difficult to estimate the cost of the material used in producing a dozen card pictures, but it is more difficult to estimate the value of the artistic skill and training employed in producing them. When a man puts very low in price, it is evident that he estimates the value of his time and skill at a very low rate, and an artist who respects himself and his profession will not enter into competition with him. Do not be induced to enter into a race for the lowest price, rather aim to produce superior work.

A. P.—You will doubtless find that the Autotype Company, who are owners of the patents, hold a very different opinion as to the necessity of a licence for working the Lambertaine process, an opinion they will probably enforce in Court. Unless you wish to test the question by becoming defendant in a chancery suit, we should not advise the risk. See some remarks in a leader in this number.

G. WRIGHT.—We will endeavour to ascertain. We think it very doubtful that any conditions would be agreed to at the time of enlistment, and in any case a certain time—several months, we believe—must be expended in drill and training.

RESIN IN ALCOHOL.—A large number of the gum resins are soluble in alcohol. Shellac, mastic, sandarac, and various others are soluble, wholly or in part, in alcohol.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. J. GALL, Newton Abbott,
Four Photographs of Mr. H. Winsor
Mr. R. S. BAKER, Birmingham,
Photograph of the late George Davey.
Mr. JOHN W. CLARK,
Five Photographs, Groups, Prince of Wales, &c.
Mr. J. H. WOODALL, Leamington,
Six Photographs of himself.
Messrs. TAYNOR & CO., Leamington,
Two Photographs of Mrs. Bunting.
Two Photographs of Rev. W. Bunting.

The Photographic News, April 6, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY IN THE LAW COURTS—INDIA-RUBBER AND ITS DEGREE OF SOLUBILITY—A GOVERNMENT ASTRONOMICAL OBSERVATORY IN FRANCE.

Photography in the Law Courts.—Photography has often given evidence in a court of law, but it is rare to make use of illustrations produced by the art in the manner adopted in a civil action lately. A tradesman sought to recover damages on behalf of himself and his family on account of being poisoned by American tinned meat. It was alleged that having partaken of a tin of some preserved animal food the family were at once stricken with sickness, and the sufferings undergone, and doctor's expenses incurred, formed the basis of an action against the merchant from whom the tinned meat had been purchased. The latter indignantly denied the circumstance that anybody could be taken ill from eating the meat he imported; on the contrary, he was prepared to show that those who continually fed upon such provisions were unusually well and healthy; and his learned counsel, to make good the assertion, presented the jury with photographic portraits of the defendant's family, which had been brought up mainly upon the food in question. The pictures presented the boys and girls in question of a singularly rubicund character, all of them full-faced and round-cheeked. Such evidence seems at once to have convinced the jury, for they soon afterwards returned a verdict in favour of the defendant. We suppose the time was limited, or otherwise the course of the plaintiff was clear under the circumstances. He had nothing to do but rebut the evidence adduced by the defendant. Against the rubicund family series of the defendant—the portraits, no doubt, cunningly retouched to dissipate any wrinkles or folds in the skin, and make the sitters appear as sleek and fat as possible—the ill-used plaintiff should have set another series representing his family, ill and emaciated, as they no doubt were. With judicious lighting and exposure, very suitable pictures for the purpose might easily have been secured, and these would, no doubt, have told upon the jury with quite as much weight as did the rival pictures of the tinned meat merchant. If photography is to be employed on one side, it is only fair that it should be represented on the other. The defendant had evidently stolen a march upon the plaintiff, however, and taken him unawares. It is singular that the plaintiff did not guess the defendant's line of action, for the idea was not a new one, although its application may be. Mr. Wackford Squeers, as everybody knows, always presented his well-fed boy as a proof of the highly nutritive food dispensed at Dotheboys Hall, and we have no doubt whatever that had cartes-de-visite been invented in his day, Mr. Squeers's pocket-book would have been full of them.

India-rubber, and its Degree of Solubility.—Photographers are well aware of the difficulty with which some samples of india-rubber dissolve in benzole, even when the former has been masticated with great care—and, indeed, this circumstance has stood in the way of its application in photographic processes frequently. Sometimes it has been affirmed in these columns that rubber will easily dissolve, while at other times complaints of the impossibility of getting anything but a thin solution on the application of benzole have been rife. The reason for this appears to be that rubber from various countries differs very greatly in its solubility, and a German chemist, Heeren, has shown that benzole will take up in solution four times as much of one rubber than of another. This chemist has made a careful examination into the solubility of a dozen different species of rubber, and having first worked the samples between hot rollers to masticate them, he cut them into thin strips, and added benzole. After frequent shaking, and securing solutions of as thick a consistence

as possible, it was ascertained how much in a certain volume of liquid there was of india-rubber. Guajaquil rubber was found to be the most soluble, one hundred parts of benzole taking up as much as twenty-five parts of this description of caoutchouc. Next came Para, of which one hundred parts of benzole took up twenty of rubber, and this was followed in solubility by Carthagena and Borneo samples. The worst examples, so far as solubility is concerned, were so-called Africa—Knakels, Africa—Niggara, and Madagascar. This last was very difficult indeed of solution, one hundred parts of benzole only taking up six parts of the rubber—a fact that may afford some consolation to photographers who have been trying their hardest to get a sample of caoutchouc to dissolve. We do not know much about Guajaquil rubber, which stands at the head of all the samples examined by M. Heeren, but Para rubber, which stands second, is always to be had in the market, and in this country enjoys a reputation for being the best article. Very little rubber is, however, soluble before being masticated, photographers should remember, and those who employ it, either in the form of a preliminary coating or in the preparation of films, should bear in mind that a vast amount of trouble and labour may be avoided by purchasing the material already masticated. It is to be bought in the form of thin sheets, something resembling tripe in appearance, and in this worked condition it will be found very soluble in benzole. Some photographers, we know, purchase india-rubber cement, which is but rubber dissolved in benzole, and this they dilute with more liquid till of the required consistence; but this cement, unless very pure and of exceptionally good quality, is not adapted to photographic manipulation. It contains a large amount of foreign matter from dirty rubber or from impure benzole spirit, and this, so soon as the cement is diluted, appears most unmistakably upon the film in the form of black particles and coarse fibre. The best plan, therefore, unless the solution is simply required as a cementing material, is to purchase the finest rubber in a masticated form, and, after washing it in hot water and drying, to dissolve the same in the best sample of benzole that can be obtained. Some advise the previous softening of the material in chloroform, but this we have never found to be necessary if good soluble rubber is at hand.

A Government Astronomical Observatory in France.—The French government have resolved to make good use of the old Chateau de Meudon. This favourite picnic resort, surrounded by a fine park and woods, shared the fate of St. Cloud and many other grand dwellings in the neighbourhood of Paris, being burnt during the last war. The four walls only are now standing, and the French government has decided to have the building restored as an astronomical observatory. The height of the grounds naturally recommends it as a site for such an establishment, and, as our Paris Correspondent has already informed our readers, M. Janssen, the well-known astronomer, has been named director of the new institution. No one will grudge M. Janssen his good fortune. He has worked long and arduously in the cause of science, and has undertaken several tedious and dangerous journeys on behalf of the French government and scientific bodies. His last pilgrimage was to Japan, when he headed the French expedition to that country to undertake observations connected with the transit of Venus. The hats and tents that were carried on this expedition were all carefully brought back with the instruments, and the French government having permitted the farther use of them by M. Janssen, that gentleman did not delay their erection again outside Paris on Buttes Montmartre, where he continued his interesting researches with telescope and camera. A permanent astronomical laboratory has now been sanctioned, as we have intimated, at the Chateau de Meudon, and thither M. Janssen has now removed his impediments until a permanent building shall have been got ready to receive them.

PREPARATION OF EMULSION PLATES BY DAYLIGHT.

BY DR. OSWALD LOHSE.*

POITEVIN described, as far back as 1863, a photographic method which provided for the greater part of the preparation of sensitive plates outside the dark room, and in the midst of open daylight. The method was based upon the property of iodide of potassium, not only to render iodide of silver non-sensitive to light, but to annul any action of the light which had taken place, so that on the application of an ordinary developer no result was to be obtained. The sensitizing of the plates was undertaken with tannin.

The employment of this process of Poitevin appears to have been very limited, and at the present day an operator would not, without much pressing, leave his dark recess to go into full daylight to dip the collodionized plate into the bath. How is it possible to annul this extraordinary action of the light, when it often gives us the utmost trouble to prevent a fogging of the picture, owing to a slight defect in the dark slide, or from the penetration of rays through a chink in the door of the dark room. Is not the quantity of light which the lens admits, and by the aid of which the deepest blacks in the negative are produced, so very small in comparison with the flood of light which comes direct upon the plate in daylight, to say nothing of sunlight? And yet in the Poitevin method there was nothing to fear from the action of such powerful rays. The treatment with iodide of potassium which followed the washing of the plate destroys all results of the action of light; even a slight blackish-browning of the iodide of silver has no influence upon the negative to be subsequently produced.

It is not necessary to point to the advantages which a process enjoys, the greater portion of which is to be carried out in full daylight. As to the sensitiveness of the iodide of silver films after their treatment with iodide of potassium, and afterwards, in the dark, with tannin, I have not, I will admit, arrived at particularly favourable results, as the great advantages which the method in question has for my photo-astronomical work has caused me to essay other substances besides tannin, albumen in combination with ammonia being one of them. By means of these substances I succeeded in securing a sensitiveness which for the reproduction of well-lit landscapes was quite satisfactory. Having so far been successful, I next proceeded to find out whether I could not, beyond the advantage of working in the daylight, also do away with the silver bath, or, in other words, I desired to find out whether I could not apply the de-sensitizing action of the iodide of silver solution to the bromide of silver emulsion process. I was met at the commencement with many difficulties, for I experienced considerable trouble in securing pictures perfectly free from fog. I developed with pyrogallie acid and silver, and, as soon as the latter was added, I became at once aware of the fog in the dark room. Dipped plates and emulsion plates treated alike were very different in their action; while the former gave perfectly clear pictures, the others invariably fogged.

It would lead me too far were I to make known the many experiments—some of them of practical importance, no doubt—which I undertook to get at the source of this error. The phenomenon became all the more mysterious the more searching were my investigations. Finally, however, my efforts were crowned with success, for I found that the fog sensibly diminished when an alcoholic iodide of potassium was made use of. This at once enlightened me. The emulsion plates were washed in the same way in the rinsing water, and then treated with a five per cent. solution of iodide of potassium. By washing, the pores of the collodion became closer, the iodide of potassium solution could not completely penetrate, and, consequently, was

unable to annul the action of the light. The emulsion plates prepared in daylight were, before even the ether and alcohol had altogether evaporated, dipped at once into an alcoholic solution of iodide of potassium, and in this way I secured clear negatives, full of detail. To set out a more intelligible statement of my present mode of preparing my plates, I have drawn up the following details of the process.

Manipulation.—The glass plates upon which the collodion is to be poured are, in the first place, washed with water, and then dried with a linen cloth. Then a broad camel-hair brush is drawn across the surface to remove any dust or fibres. A dilute solution of caoutchouc in benzole is poured over the plate, and the latter put on one side to dry. After a few minutes the emulsion, whose composition I give below, is poured on with care, and very slowly, the collodion being permitted to flow backwards before it runs off. When the emulsion has set, the plate is forthwith put into the alcoholic solution of iodide of potassium, which has previously been acidified with acetic acid. In this solution the plate remains for some time, until the oiliness upon its surface has disappeared; it is then washed in the dark, and poured over three or four times with albuminate of silver, rinsed, and exposed wet or dry. The development and intensifying with pyrogallie acid and citrate of silver are best done in a porcelain dish, as well as the fixing.

Description of the Preparations Employed.—The emulsion is prepared in daylight, in the well-known manner according to the following formula:—

Normal papyroxyl collodion of four per cent. strength	...	35 cub. cent.
Normal collodion from gelatinized cotton	...	25 "
Ether	...	16 "
Alcohol	...	24 "
Bromide of cadmium	...	1 gramme
Nitrate of silver	...	1 "

Shortly after the mixing of the constituents the bromide of silver appears of a curd-like consistence, but after the lapse of six to eight hours a serviceable emulsion is formed. Washed emulsion, which can also be produced by daylight, is likewise suitable for the purpose. If it is desired to allow the emulsion to remain in a light room for some time, it is well that it should be preserved in a bottle of yellow glass, or the vessel covered with a paper envelope. Instead of bromide of silver, chloride of silver may also be employed as emulsion. I then work according to the following formula:—

Collodion	...	as above
Chloride of calcium	...	1 gramme
Nitrate of silver	...	2 grammes

This emulsion is somewhat less sensitive, but is to be recommended when a picture of a well-lighted landscape is desired in which the sky is not solarized.

De-sensitizing Fluid.—The alcoholic solution of iodide of potassium, with which the plates are treated after the emulsion has set, brings about a superficial change of the bromide or chloride of silver into iodide, a transformation that is apparent by the yellow colouring to be observed. In the bromide of silver emulsion there is both iodide and bromide of silver in the film exposed, and then there should be more sensitiveness than in the case of employing the silver compounds separately.

As bromide of potassium solution also acts as a de-sensitizer, and possesses the property of transforming chloride of silver into bromide of silver, we have in our hands the means of preparing many combinations of mixtures of chloride, bromide, and iodide of silver to be employed as sensitive films, which would be useful for various purposes.

As regards the amount of iodide of potassium in the de-sensitizing liquid, this is a matter of more or less impor-

* Photographisches Archiv.

tance only. I employ as nearly as possible the under-mentioned mixture :

Water	...	...	45 cub. cents.
Absolute alcohol	...	...	45 "
Acetic acid	...	...	10 "
Iodide of potassium	...	...	5 grammes

From time to time, some new iodide of potassium is added. The solution becomes of a yellowish red on the addition of acetic acid.

Sensitizing Liquids.

No. 1.—Albumen...	...	...	67 cub. cents.
Water	...	...	33 "
Ammonia	...	...	12 drops
No. 2.—Nitrate of silver...	...	...	6.25 grammes
Distilled water	...	...	100 cub. cents.

And as much ammonia as is necessary to make disappear the precipitate formed on mixing.

On employment, a quantity of No. 1 sufficient to cover a plate is poured out in the dark, and to it is added a few drops of No. 2.

Instead of albumen, other substances may be employed with advantage; as, for instance, flour, starch, gelatine, ordinary glue, gum-arabic, caragheen moss, milk, &c.

Developer and Intensifier.—The ordinary formula for preparing pyrogallie and citric acid silver solutions may be here employed.

By means of the process which I have described, I have secured very clear and detailed landscape pictures, and can recommend the method to all photographers to practise upon and perfect who are interested in the technical elaboration of the art, and who wish to emancipate themselves from many of the complicated, and in some cases faulty, manipulations to which we have been clinging for some time past.

M. LAMBERT'S INSTRUCTIONS FOR CARBON PRINTING.*

"In developing, do not pull the tissue too hard, and not up, but down, or let it come off by itself in the vertical trough. A glass which has already been used once in the process must not be washed or cleaned again; simply scrape the collodion from the edges, then wax, &c. It is advisable to put the glass, after laying on it the pieces of tissue, under pressure for about a quarter of an hour previous to development. Should your prints, when finished, have little glossy spots, it is a proof you have put your transfer paper in water too hot or too cold, or have kept it for too short or too long a time in the warm water; you must use water just warm enough, and leave the paper in just long enough to feel slimy. You can avoid all these glossy spots by immersing the transfer paper in a very warm weak solution of white gelatine filtered, previous to applying on the glass. All these glossy spots are caused by non-adherence of transfer paper on film. If you wish a matt surface, develop on the ground side of the plate; if you wish the albumen paper glossy, mount the prints as usual, and roll them. Always develop a little more than apparently required. Never develop too quickly, as if you use water too hot the film will take a wrinkled appearance, as of myriads of little broken lines. After fixing with alum, to harden the film, wash well. Never use a glass to develop on unless its edges have been well roughened on grindstones, or it will cut the collodion, which will run off in developing. If you leave the pieces of tissue too long in the water before applying to the glass to develop, they will curl up, and may not stick to the glass. If you put the collodionised glass in the water before it is well wet, the collodion might leave the plate after and form spots. Better leave your collodionised plate in the water too long than too short a time.

* Continued from page 57.

"Never hurry the drying of the prints after development, for the film will then break and fly off. Before placing the pieces of tissue on the glass for development, place them in cold water until they get flat, and always throw a little water on the glass before applying them on it. Apply the pieces of tissue on the glass by placing at first the lower end on the glass, and lowering the top end gradually, so as to drive away all air-bubbles. If the tissue is properly placed it will move easily on the glass; if not properly placed, you can repeat the operation.

"Thin your collodion if too thick to collodionize your glasses, to develop on, with half ether and half alcohol. As soon as the pieces of tissue touch the water they lose their sensitiveness, so you can develop in full light. Never use a jet of hot water to reduce a print, as often done, because you destroy half-tones (unless the print is too much exposed and you have not time to print another). It is advisable to use the water not too hot to begin with, and to heat it gradually.

"Never use zinc to develop on; ground-glass is preferable, as it gives more softness and half tones. Never print in the sun; if so, print until the photometer shows a quarter more exposure than would be required in diffused light.

"Always cut the pieces of tissue a little smaller than the negative you wish to print from.

"Should you not have light enough to quite finish the exposures, develop the next day, as there is continuation of insolubility even in darkness.

"In damp weather the tissue is more sensitive, so exposures less. A vigorous negative will, with the same tissue, produce a warmer tone than a weak one.

"Put the transfer paper in very clean water, warm enough to make it slimy and sticky, or there will be no adherence, which would produce innumerable very small air-bubbles. After the application of the transfer paper, you may dry by heat or by the sun. Never transfer before the prints are completely dried. The transfer paper must always be cut a little smaller than the glass it is to be applied to. If your water is either too hot or too cold, there will be glossy spots on your prints. A few drops of ammonia in the warm water in which to immerse your transfer paper will prevent the glossy spots on prints which are caused by non-adherence; the ammonia renders the gelatine more soluble.

"After floating the transfer paper on the warm water, and rubbing the face of it with a fine sponge, to take off air-bubbles, dust, &c., apply it on the glass as explained for the pieces of tissue. Touch the water also with the glass (provisional support), face downwards, before applying the transfer paper on it.

"If the film has a tendency to peel off in drying, before transferring, you can avoid it by rubbing off the wax from the edges of the glass (before collodionizing) with a cloth and a little alcohol. When the transferred print is dry, cut the edges off and pull it away.

"For full-enamelled prints, which you wish to mount on cardboard, rub the wax off from the edges of the glass so that the cardboard sticks well on it. Use the cardboard a little damp by placing it between damp sheets of blotting-paper.

"If you wish to mount your prints full gloss, this is the best way. When the transfer paper on prints is about half dry, apply, with starch or paste, a thin cardboard, previously placed between damp blotting-paper; when very dry, pull it off from the glass, cut the prints, put glue on the four borders, and mount on your own cards, taking care not to wet the face of the prints. The longer the prints are left on the glass, the finer will be the gloss.

"In commercial work, when the transfer paper put on prints is quite dry, put it in water for a few moments, pull off then from the glass, and mount the same as for silver prints.

"If you wish to mount full gloss prints on very thick cardboard, do as follows:—Rub starch paste on both the

transfer paper and cardboard, and stick them together while yet on the glass; then put under pressure for half an hour, and let dry.

"Wax your ground-glass as follows:—Coat with waxing solution, rub once or twice only with papier Joseph, then polish well immediately with flannel. Mount them as you would an albumen print on your usual cards; spot, roll, and encanticate them. Develop on ground-glass, waxed and collodionized. Mount while yet on glass, as for full enamel prints.

"Always border your negatives or transparencies before printing from them; for if not bordered with black paper as taught in demonstrations, the film printed from either of them might wash off during the development, or the edges or other parts of the film might curl, crack, or peel off.

"You might lose half-tones in high-lights if you use old sensitized paper, or a sensitizing bath too old, or used to sensitize too much paper.

"Always use clean water to put your glasses in after collodionizing.

"For prints developed on ground-glass, without collodion, you can obtain the double albumen paper gloss by rolling with a hot press, and waxing the prints while yet warm.

"A full enamelled print will be about one-third stronger when dry than while yet on the glass.

"If you wish to colour a finished chromotype, rub its surface with alcohol previously.

"If you have to retouch a white spot on the light parts of the print when yet on the glass, do so with indian-ink, to which add other colours to get the tone desired, and spot as you would an albumen print; then take a little collodion on your brush, and let a drop fall over the retouching to imprison it, and when dry, transfer. To retouch on tissue while yet on glass, use a very soft pencil, wetting the point of it often. It will stand water.

"If there is any wrinkling or reticulation on the prints or transparencies, it is caused by the paper being dried in a room which is too hot. Should the print stick to the glass by bad waxing, you may save the print or clean your glass by putting it to soak in water. If the print comes out entire, you can mount it like an albumen print.

"If you wish to reintensify transparencies a black-blue tone, use,—

"Solution No. 1.—Warm water ...	4 pints
Gallio acid ...	60 grammes
"Solution No. 2.—Sulphate of iron ...	40 "
Acetic acid ...	40 "
Water... ..	2 pints.

"Mix in small quantities, and use to reinforce either negatives or positives."

THE OFFICE OF VIOLET RAYS IN THE PRODUCTION OF NEGATIVES.

BY LEON VIDAL.*

FOR some months past, thanks to M. Scottelari, the question of lighting studios by means of violet glass has once again been discussed, and, in entertaining the subject, photographers have occupied themselves much more over the greater rapidity of such a method of lighting, than of all the other advantages which it leads to. Practical experience is certainly the best guide in matters of this kind, and no theory, however subtle it may be, should be preferred to it.

Experiments upon the action of violet rays projected upon objects to be reproduced in the camera have already been made under various auspices, and it will be prudent, before forming a conclusion that shall be safe from attack to await the verdict of those who have undertaken such experiments. Our object is not to affirm anything in

advance, but only to support the research now being made by a few observations and speculations.

Nobody occupies himself with photography without knowing that the violet rays of the solar spectrum are those which are endowed with the greatest chemical activity; but what is not generally known is the quantitative relation existing between the visible and invisible rays of the spectrum, and also the actinic power of the invisible rays situated upon the spectrum band beyond the ultra-violet. In order to be perfectly understood by those who are not initiated in the mysteries of the decomposition of light by means of a prism, it will be well for us to explain what is understood by invisible rays, and how it is possible to know of their existence.

A pencil of solar light being projected upon a prism, its decomposition is at once brought about, and the different rays of the various rays unequally refracted form upon the surface of a screen placed in their path a rectangular and polychromatic band which is termed the solar spectrum. The screen upon which the spectrum is projected may be the ground glass of a camera of which the lens has been taken out to make way for a prism.

To the eye the coloured band is clearly perceptible, and it is easy to trace, by means of a pencil, the limit on one side of the violet rays, and that of the red rays on the other.

If the limit of the violet rays is led, first of all, to the right of the ground glass, nothing but complete obscurity is to be observed upon the surface. By substituting, however, a sensitized collodion plate for the ground glass, and securing an image by development in the ordinary manner, there will appear upon the film a black band, almost as long as that of the visible spectrum, and representing a prolongation to the left of this. This prolongation is due to the invisible rays which are a continuation of the violet rays, and whose actinic intensity diminishes until they meet or fuse into the red rays, supposing the band of the spectrum to be annular.

Thus it is seen that between them the invisible rays and the visible violet rays possess an actinic power at least equal, if not superior, to the whole of the other visible rays; and if we add the very actinic action also of the blues, there remains but to take into consideration the inactive yellow and the two colours dependant upon it, the green on one side and the orange on the other, and finally the red.

Now, violet glass permits the passage of the invisible rays and of the violet and the blue, and the polychromatic object to be reproduced, therefore, is bathed in a light of an essentially actinic character. Moreover, the red colour combined with violet rays loses its lack of actinism, and is reflected not only in the condition of a red colour, but in that of a carmine. It impresses the iodide of silver just in the same way as rays of the last-mentioned colour do when white light is reflected on it; that is to say, under the circumstances of violet illumination you are certain to obtain very nearly the effect of the red with an exposure sufficient for the violet and blue rays to act.

Yellow and its combinations are yet tardy in their action, yet not to that extent as when they reflect only white light, because one has the benefit of the greater actinism produced by the combination of this colour with violet rays.

The above are the arguments which lead to an *a priori* reasoning that violet illumination will shorten exposures; and it is for this reason that we believe in the efficacy of violet light projected upon a polychrome object to be reproduced, being of opinion that under the circumstances more perfect negatives would be obtained in respect to the relative value of the colours upon the model. Not that the important question of relative value is thereby definitely settled, but that we are now one step nearer its solution. We ourselves shall take an opportunity of returning once more to this subject at an early moment, when the results of some important essays which we are making in the matter shall have been secured.

* *Moniteur de la Photographie.*

HOW TO PRODUCE FAULTLESS PICTURES FROM DEFECTIVE CARBON TISSUE.

BY H. NORDEN.*

It has happened to many who have busied themselves during the past summer with carbon printing, that they have met with difficulties in regard to the tissue, and been so plagued with unsuccessful results, that they have lost all desire and courage to work the process. I have succeeded, by having recourse to a simple plan, in annulling the worst of all defects in carbon printing, and have been able to produce good impressions from even faulty tissue.

During the past summer, when many carbon printers after continued insuccess and vexatious failures, turned their attention once more to silver as a medium for their pictures, I have been able, by the aid of the method to which I refer, to continue to print in permanent pigments surely and uninterruptedly. That the faults are due to the tissue alone rests upon an incontrovertible fact, which I will communicate in a few words.

It was in May last when I first made the acquaintance of these very unamiable qualities of the carbon tissue. The events coincided exactly with the opening of my newly-erected studio for carbon printing, and my vexation and injury were the greater, as I was in this way rendered powerless to supply the carbon prints which I had promised. I tested all sorts of carbon tissue from various manufactories, and with always the same result: there were grain and reticulation to be seen always after development, which not only injured the tone of the picture, but robbed it of all its delicacy and beauty.

In my experiments, which went so far as the examination of samples in my waste paper basket, testing old cuttings and remnants of tissue of a previous date, I discovered a large piece of tissue which, under exactly the same circumstances, yielded me quite faultless results. By a closer examination of this paper, I found that the tissue in question contained no soap, while all the other tissues, as soon as they came into the warm water, at once spread a black kitchen atmosphere, while the water on being much agitated gave a froth similar to that seen upon a washing tub.

Further experiments which I made in the preparation of carbon tissue confirmed my first suspicion that soap was the base enemy in the tissue which, in summer time, brought about those phenomena which are the despair of all carbon printers. A closer research into the matter which I made need not be here described in detail, as it would lead me too far, and at the same time scarcely interest the readers of these lines; suffice it to say that I found, when soap was present, that the ugly phenomena occurred, which were not to be met with when this compound was not a constituent of the tissue. Thus it was absolutely proved that the fault was in the tissue itself.

I will now briefly communicate in what manner I am able to eliminate from tissue the defects it presents on development, whether these consist in a reticulated or grainy film, or in tiny bubbles in the case of development on glass or transfer paper, or in a loose attachment to the basis on which it is developed.

I sensitize in a four per cent. chromate bath, putting in the tissue in the rolled-up form in which I buy it, the material being gently and slowly passed into the bath and unrolled from the top. (This method has, however, nothing to do with the removal of failures, and I only communicate it so that others may know my precise method of working). As soon as the tissue stretches itself out—not longer—I take the sheet out with as much liquid as possible, and place it, avoiding air-bubbles, upon a patent plate that has previously been covered with a five per cent. solution of oxgall; the sheet of tissue is then squeezed, and allowed to dry on the glass. After printing in the ordinary manner, the tissue is immersed in water, and here placed upon a waxed and collodionized plate in the manner following

* *Photographische Artiste.*

I take the sheet, which, by reason of its drying upon glass, is very smooth and even, and holding it vertically with the lower edge in the water, lower the tissue till it touches the bottom of the bath. By continually pressing downwards and forcing the film away from oneself, the whole sheet is brought under water, the operation being facilitated by adding a wavy motion to the sheet. The operation must be performed quietly, and without any hesitation. As soon as the tissue is under water, I wait a few seconds, and before the tissue has well time to stretch itself, I take it, lying in its proper place on the glass, out of the bath and squeeze it, putting it back again, pressed as it is into the water, until I am ready to develop. I have permitted pictures to remain for hours in water in this way without having observed any material change one way or the other in them. In any case, however, it is indispensable, if you wish your picture to develop perfectly, to let it remain for ten to fifteen minutes in the cold water, so that it may be quite saturated.

As soon as this is the case, I put the glass plate into the dish of pretty warm water, from 35° to 40° Reaumur, in which case the paper backing is soon removed. As soon as this happens I put the glass plate into a developing dish with a trough bottom (taking care to avoid air-bubbles), the image being placed face downwards. In this developing dish the water is not more than 23° R., and the image is allowed to develop by itself.



After development, I rinse with warm water, and afterwards with cold, put the plate for a few minutes in alum solution, rinse again, and put it to dry.

In the case of tissues which possess the above-mentioned defects only in a slight degree, this manner of treatment will suffice to yield good pictures; but in the case of very bad tissue there is still one other manipulation necessary, the performance of which, however, is amply compensated for by the production of brilliant and certain results.

The handling of such tissue remains exactly the same up to the end of the printing process. As soon as a sufficient number of printed carbon sheets are at hand, I proceed in the manner following:—Collodion which has served for



the coating of the waxed plates is diluted with four-fifths of its volume of alcohol; this is poured into a metal dish, the size of which must be governed by that of the picture. The length of my dish is that of a cabinet picture. For larger pictures I have another mode of proceeding, respecting which I may, perhaps, have a subsequent opportunity of speaking. I now take the printed pieces of tissue, draw them well through the diluted collodion, and hang them to dry by means of American clips, the drying being complete in from ten to fifteen minutes, according to the temperature of the atmosphere.

After drying, the treatment of the tissue is precisely the same as that above described, and photographers will find that not a single case of defective development will come under their notice, even with the worst kinds of tissue, if they follow this plan of working.

The retouching of carbon prints may be undertaken with ordinary gum or albumen colours, the developed picture, after it is dry, being once more coated with thin collodion. If this is not done, then, notwithstanding the perfect appearance of the picture upon the glass, the disagreeable network formation will appear again as soon as the image is transferred to paper, and your labour and trouble will have been in vain.

Those who have not to struggle with tiny air-bubbles on transferring upon glass, need not let the tissue, after sensitizing, dry upon the glass plate, but have only to remove the superfluous liquid by pressing with a glass rod to the right and to the left, and to hang up the tissue to dry.

The Photographic News.

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RAPID CARBON PRINTING.

WE are favoured by Mr. Witcomb, of Salisbury, with another communication on what is termed by the Lambertype licensees "chromotype" printing, together with two charming card-portraits as illustrations of a rapid mode of working which he describes. Primarily we may remark that these prints afford striking confirmation of our remarks in a recent article as to the possibility of rapidly drying excited carbon tissue without risk of reticulation. The tissue in this case was dried directly before the fire, and within a quarter of an hour of sensitizing was exposed under a negative, and no trace of reticulation or defect of any kind is apparent. Another important saving of time is effected which will be found valuable where dispatch is of importance. Mr. Witcomb avoids the usual operation of drying after development and before transferring, and he finds, besides practical convenience and saving of time, that the prints are in no wise injured by this treatment. He finds carbon printing on the whole so easy and so quick, and so satisfactory to the public, that he anticipates little difficulty in giving up silver printing, and adopting carbon solely for all his work. Already he says that forty-nine out of fifty of his clients prefer the carbon prints at a higher price than the silver.

This is a satisfactory statement of experience, frankly and liberally given to the community at large. Mr. Witcomb, at least, is not amenable to the charge somewhat frequently and bitterly made of late, that the Lambertype licensees were forming themselves into a separate and peculiar people amongst photographers, sworn to divulge nothing to outsiders who cannot pronounce their shibboleth. That special tuition and special privileges should be offered by the owners of the Lambertype patents to licensees who purchase these privileges is natural enough, and that it may be wise to secure the right to this tuition and other privileges, where carbon printing is adopted as a commercial enterprise, there can be little doubt. But we cannot see the wisdom or necessity of existing licensees exercising this spirit of exclusiveness. They, at least, have nothing to gain by it, neither in *kudos* nor cash. Carbon printing is a new art, and there is, and inevitably will be, for some years to come, much to learn in connection with it. The interest of all practising it must be found in the ready and full intercommunication of experiences therein. This has hitherto been the general practice of photographers, and to this rapid progress has chiefly been due. We do not for a moment suppose that this practice will cease as a general custom, even if a few persons, from some obscure motive, form a compact of secrecy. The numerous communications to our pages by Lambertype licensees show that this feeling is not by any means universal, and in our personal intercourse with M.

Lambert and his pupils we have found the most liberal and frank communicativeness at all times. Mr. Witcomb concludes his communication this week by an intimation that he hopes shortly to have further experiences to communicate, which he will impart to the little brotherhood who paid M. Lambert thirty pounds, if not to photographers generally. We have no doubt he will be better than his word, and impart to the larger brotherhood to whom he is affiliated, through the existence of which he, and every existing photographer, has acquired very much knowledge of his art without any payment at all.

PHOTOGRAPHY AND THE KORAN.

PHOTOGRAPHY has been able to solve a difficulty which has existed for many years in connection with the religious books of the Turks. The Koran, it is averred, must not be printed, but must always appear before the Faithful in written characters. Translations of the work in European languages have, as everybody knows, appeared in type, but to be holy in the eyes of the Mussulman and his brethren, the work must not be in this form. Naturally, the multiplication of copies by manuscript is a tedious and costly process, and hence the Koran is always a rare book.

But to reproduction by photography there seems to be no objection, for the copies still appear, as in the original, in written characters. Photography is so different in its nature to other modes of copying, and presents us with such a true reflex of the original, that even the most conscientious Jew could hardly find fault with a reproduction of the Koran made through the intermediary of the camera. Indeed it is a far purer mode of copying than by the quill, even in the event of the writers being men of the strictest integrity. So the art of photography—or, rather, *Lichtdruck*—has been impressed into the service, and at the present moment the firm of Frühwirth and Co. is engaged upon the reproduction of the Koran by that method. As may be expected, many strict conditions have to be fulfilled in carrying out such an affair, so that nothing may possibly desecrate the sacred writ, and the work, we believe, is supervised very carefully by those in authority.

The reproduction of the Koran in this way affords one more illustration of the characteristic value of copying by means of photography.

CARBON PRINTING.

BY GEORGE CROUGHTON.*

IN continuing the subject of carbon printing, I must apologize for the delay which has taken place between the commencement and conclusion of my remarks, which has been caused by pressure of business; but I am glad to find that others have taken up the ball and have kept it rolling.

As I presume no one would be simple enough to commence carbon printing without going to the fountain head and getting an Autotype Manual, and as Mr. W. Turner has described the various parts of the process in detail, I will confine myself to describing my failures and their remedies, and to pointing out those parts of the process which appear, in my experience, to demand especial care.

To commence with the tissue itself. To keep it in good condition it requires a deal more care than albumenized paper. I have seen it recommended to keep it in a cellar, but I have found the least damp is fatal, one of my first failures being caused by putting some pieces cut from the roll into the portfolio where the albumenized paper is always kept, and finding them stick together. A place should be found both cool and dry, and I think there are few cellars which answer to this description. I suppose it need not be added that dust and loose particles of paper, &c., should be carefully kept from the carbon surface. The bichromate solution, too, should be kept cool, and not

* Continued from page 70.

be used too often. I am using the two salts—bichromate of potash and bichromate of ammonia. I dare say adding a few drops of ammonia to the bichromate solution answers the same purpose, but I happen to have a quantity of the bichromate of ammonia, and so have not tried it yet. In taking the tissue out of the sensitizing bath in warm weather, I use the method advised by Mr. Spencer some time before he became one of the managers of the Autotype Company, viz., when the tissue has been in the bichromate solution long enough, it is drawn out face down upon a sheet of perfectly clean patent plate larger than the tissue, and the superfluous solution pressed out by a gentle use of the squeegee; it is then lifted from the glass and hung up at once, and in the hottest weather I have never found the tissue run, as it has done if lifted out of the bath and hung up without this treatment. In cold weather there is no need to take this trouble; I follow out the directions given by Mr. Sawyer, viz., after taking the tissue out of the bath it is placed face up upon blotting-paper placed over a piece of card bent into a half circle; it is allowed to partly dry, and then hung up to finish.

Want of care and cleanliness will be the cause of failure in this as in every other part of the process. The dish must be perfectly clean, the sensitizer well filtered, and no dust about; and before hanging your tissue in the sensitizing room, see that the surface is quite free from dust or loose particles of the paper, &c.

The next part of the process, the drying, is, in my opinion, the most important. I see by last week's NEWS, that Mr. Mayland can dry his tissue in thirty minutes, and yet avoid that dreadful pest, reticulation. Now most of my failures with small work developed upon collodion have been caused by quick drying, and after seeing the statement made by Mr. Sawyer during the discussion upon carbon printing, I have dried my tissue slowly, and have not been troubled with reticulate tissue. What is the cause of this discrepancy? That is a question I cannot answer. I can only state, as a fact, that when I dried quickly I was never free from reticulation; and now I dry slowly I am quite free from it. There is one thing I notice, Mr. Mayland squeezes out the superfluous bichromate before putting the tissue into the drying box; this may have something to do with it, for my quick drying has always been done in the winter, and the tissue has always been hung up direct from the bath.

But, dried slowly or quickly, it is most important that the drying should be always alike. The importance of this will be seen at once when it is remembered that the length of time the tissue taken to dry regulates the time of exposure, quick drying causing long exposure, and slow drying a quicker exposure; therefore if a quantity of pictures are to be printed from one negative, and the tissue is sensitized in two or more batches, each dried at a different temperature, it is impossible, with the best actinometer, to get the prints all alike, for the actinometer represents a certain standard of tints which is unalterable, and if the first picture printed with tissue, which has been taken, we will say, four hours to dry, takes three tints upon the actinometer; and a second is printed from a batch of tissue dried, we will say, in thirty minutes, that three tints upon the actinometer will give, with this tissue, a picture much less exposed than the first printed to the same number of tints; it will be seen, therefore, that unless some plan be adopted for drying the tissue at one uniform temperature it is impossible to work with anything like certainty.

I have adopted a very simple plan by which I dry my tissue in from four to seven hours. I have a small paraffin stove (cost nine shillings), and four boards of a certain size which stand up, the stove being in the centre; the distance these boards are away from the stove regulates the time in drying, the tissue being pinned upon the inside surface of the boards. Since using this contrivance, and resorting to slow drying, I have never been troubled by my old enemy, reticulation.

The drying being finished, see that the negative is free from dust, and the padding perfectly dry. I lost a valuable negative from neglect of this simple precaution; the damp pad caused the tissue to stick to the negative, and pulled the film up. If the tissue is too dry, you cannot get it into perfect contact with the negative.

Before going on to the next part of the process, viz., developing, it may be interesting if I describe the method I have adopted to tint the edges of the pictures without the use of cambrons and expensive printing frames.

(To be continued.)

ASCERTAINING THE TIME IN PRINTING CHROMOTYPES SIMPLIFIED.

BY J. LOEFFLER.*

When I first witnessed M. Lambert's demonstrations, the method of printing by the photometer in use appeared to me very unreliable. It also appeared very tedious, and to occasion a great loss of time, to be obliged first to print a chromotype from each negative by the number on the photometer, which, according to the printer's idea, was the right one, only to find that a mistake had been made—say, the prints were too light—and the whole operation must be gone through with again, perhaps only, on the second trial, to make a mistake in the other direction. To work a process to advantage and with pleasure, we must be certain that the result will be perfect. To make my meaning more explicit, and to show the unreliability of a meter with numbers, I give the following example:—I printed a chromotype until number 5 was well defined, and found on development that it had the proper exposure. I marked the negative "No. 5, well defined," and gave it to my printer to finish the required number of prints. He did so according to his idea of "well defined;" but every print was too dark, and, on examining the strips of paper used in the meter, I found that the printer was not to blame. No. 5 was well defined, only a little more than my No. 5; but this "little more" was probably the result of an exposure of five or eight minutes longer than mine, enough to make a great difference in the shading of a portrait. In fact, I saw that it was impossible to express in words the shade a number of the meter ought to have, so that two different persons could see it alike. Even if you do the entire printing yourself, you will find it impossible, in printing twelve pictures from one negative, to get them all alike in shade if you go by the numbers of the meter, for the reason that some of the higher numbers print very slowly, and will, during, perhaps, five minutes or more, show no perceptible difference in darkness, although those five minutes longer or shorter exposure to the light will show a great difference in the fine gradations of a face. I therefore tried to think of a surer method—one that could be understood and seen by all. During my experiments, I observed that the time required to make a print on my sensitised albumen paper, printed as dark as a silver print should be (that is, a print toned, fixed, and mounted), coincided exactly with the length of time required for a well printed chromotype from the same negative, and exposed in the same light; and this gave me the idea to use a portrait negative as a meter, which I made in the following way:—I made four exposures of a subject on a 6½ by 8½ plate, each vignette size. I gave to one four seconds, the second eight, the third twelve, the fourth sixteen seconds; developed, intensified, fixed, and varnished the negative, and backed it with mineral paper. I then numbered the four seconds' exposure No. 1, the eight seconds No. 2, the twelve seconds No. 3, the sixteen seconds No. 4. This is now my meter. As we are probably all in the habit of making proofs of our negatives, and these proofs will be made on albumen paper as heretofore, the time required for the chromotype can be ascertained while printing the proofs. Of course the negative must have the

* *Anthony's Photographic Bulletin.*

mineral paper already attached at the time of printing said proofs. I will now show how I proceed. I put the sensitized albumen paper on the negatives from which I wish to make proofs, and also on my meter negative, using very narrow strips on the meter, so as not to waste too much paper. I now turn all the frames over simultaneously, including the meter negative, and print. The negatives to be proved are examined from time to time, and the moment any of them are as dark as a finished print should be, the meter negative is examined also, and the number of the portrait in the meter which has reached the same stage of printing is marked on the back of the negative which is to be printed in chromotype, and so on, until all the exposures are found. Of course, for very intense negatives, a second intenser meter negative is required. When you come to print the chromotypes, you have only to put the chromotype tissue on your negative, and the albumen paper on your meter negative; examine the meter from time to time, and when the meter portrait whose number corresponds with the numbers of any of the chromotypes is rightly printed, turn the chromotypes over, and on development you will find that the pictures are correct in regard to depth of printing, and no loss on this account will occur. I have used this method for the last three months, and have had no failures. As I had in the beginning great trouble with this particular part of the process, I suppose that some of the other licensees have experienced the same difficulty, and may be pleased to hear of an easy way to overcome it. I must also state that on damp days in summer, when the tissue is very soft and flexible, it is more sensitive, and prints quicker; therefore some allowance in the time must be made, and the printing of the chromotype must be stopped a little before the print in the meter is dark enough. This will be only in exceptional cases, however. My method above stated will hold good for all the winter months, and most of the time in summer.

The strength of the bichromate bath and that of the silver printing bath has no doubt something to do with getting at this result; and as those using a different strength from mine ought, on that account, not to find my experience verified, I give my formulae:—

Chromotype Bath.

Bichromate of potash ... 1½ ounce
Water ... 64 ounces.

Albumen Paper Silver Bath.—Forty grains of silver to the ounce of water, with a little liq. ammonia added; the paper to be fumed fifteen minutes. I use Hovey's Rives pink paper.

It is evident that, in printing a portrait, there is only one stage when that portrait has the proper shading. Not so in printing a mere number. A number may show very plainly, and in six minutes longer exposure may not appear any darker; still the light has acted six minutes longer on the portrait which you are printing by that number, and it will have darkened, in comparison, considerably more than the number you are printing by. Therefore, that a portrait negative, as a meter, shows more minute gradations than a meter with numbers merely, is not to be disputed, and is, in consequence, a more correct criterion.

THE TRANSFER OF NEGATIVE FILMS TO PAPER.*

THE process of transferring the film from glass by means of gelatine paper, which has frequently been discussed in this journal, led me to try albumenized paper for the same purpose. The plan I found to answer excellently, whether in the case of old or new negatives.

When the negative is not varnished it only requires to have water poured over it, and then albumenized paper whose surface has been thoroughly moistened with a wet sponge is laid upon the plate, and pressed in contact with

a dry handkerchief. The albumenized paper will then bring away with it a film from the glass. Care need only be taken that when the wet albumenized sheet is placed upon the glass, no air-bubbles get underneath.

In stripping the paper subsequently from the glass, you begin at one corner of the image, where the collodion goes right up to the margin of the glass; and when necessary the border is lifted by means of a penknife or a steel pen. A preliminary dipping of the negative in a mixture of one hundred parts of water and two parts of hydrochloric acid loosens the film, but before the paper is applied the plate must be thoroughly washed, so that no trace of acid remains adherent to the film.

When the negative is varnished, the varnish is removed by placing the plate in a bath of—

Caustic potash	...	...	5 grammes
Water	...	...	60 "
Spirits of wine	...	...	250 "

The plate is permitted to remain in this bath for the space of a minute, and is then taken out, washed, and treated as above.

The stripping of the film by means of albumenized paper is a method suited for artists, amateurs, and others, and less for professional photographers, for whose work a paper basis is at times inconvenient. The former prefer to use gelatine paper, for they can then at any time re-transfer the film to glass in either sense.

The way to strip a film by the aid of gelatine transfer paper in an easy and certain manner Mr. Woodbury has already described, although that gentleman does not specify the particular kind of transfer paper he employs. But you may proceed as follows: Eighteen grammes of gelatine—Nelson's Patent Opaque Gelatine is the most suitable—are permitted to soak in cold water for some hours. The water is then poured off, and the gelatine permitted to dissolve in a water bath; gradually one hundred grammes of spirits of wine are added, the solution being stirred the while.

This solution in a warm state is applied by means of a soft brush to a piece of thin paper which is somewhat larger than the negative. The negative is well moistened with warm water, also by the aid of a soft brush, and the paper laid upon the film. Air-bubbles must be avoided.

When the paper has become perfectly dry, it is moistened with a sponge, and a corner thereof carefully lifted; then the whole is gently drawn from the glass. The paper may, when dry again, be rendered transparent, or the film may be again transferred to glass for printing purposes. Both methods are suitable for transferring films which require to be stored, and may not be wanted for printing again for a while.

Correspondence.

NOTES ON CHROMOTYPE PRINTING.

SIR,—I send you a few remarks on carbon printing, and my method of producing perfect chromotype prints in the shortest time and with absolute certainty. I do this partly as a matter of public interest, and partly in reply to numerous correspondents, whose enquiries I am not able to answer individually.

I certainly can call myself a successful carbon printer, for in my hands the process never fails, and I feel the enquiry should be, not what can be done with Autotype materials, but what cannot be done?—so sure am I that results not only far more enduring than silver, but far more beautiful and effective, can be reached, and that we are only beginning to see the great value of the new method.

My previous letters seem to have attracted a good deal of notice; and now that Sir Thos. Parkyns has, in your pages, called her attention to the speed and certainty of my

**Photographisches Archiv.*

working, and I am likely to be overwhelmed with letters, will you please let me say to correspondents that I cannot find time to give details of my methods in writing, but if any photographer is desirous of having a chromotype license, and wishes for an independent demonstration, let him come down to Salisbury, bring his own negatives, and he will find me ready and willing to show him how easy it is to produce excellent permanent prints.

And now, sir, let me repeat here what I have stated before, that nearly all the failures I see are due to using the water too hot at commencement of the development. Begin at 70°, not more, and do not soak your plates in a grooved tank, but wash up your prints in water contained in flat dishes of zinc or tin. Some will say that unless the water be tolerably hot at starting, the paper backing of the tissue will not come away. Here is the remedy. Take your prints from the frames, apply them to the collodionized glass in the usual manner, then put them under pressure for the space of two minutes only. You will find then no difficulty in stripping the paper backing, or in development; but if you keep the prints under pressure for ten or fifteen minutes, you will be simply nursing a crop of little difficulties. Try the experiment, I say, and you will soon be convinced the point is important.

As to reticulation, I very rarely see it, and cannot yet explain the reason when I do; and for want of a better reason, I am inclined to think it must be due to some fault in the material or the manufacture of the tissue. Certain I am, reticulation does not depend on quick drying of the sensitized tissue, for I have tried this repeatedly, and the causes must be sought elsewhere. As proof of this I send you herewith two cartes treated for experiment in the following manner:—

I took a piece of tissue, immersed in the chromate bath until sensitized, then removed it, face downwards, to a clean sheet of glass, drove out superfluous water with the squeegee, and then pressed under blotting-paper to absorb all moisture possible. This done, I held it, back and front, before the fire to dry, and in from twelve to fifteen minutes from starting had it into printing frame under a negative.

After exposure, soak and apply to glass, and put under the two minutes' pressure only before development. As soon as developed, fix; and, as soon as fixed, apply the transfer paper; again put under pressure for ten minutes, and you will find the image perfectly picked up—nothing lost—much better, in fact, than if the pellicle is allowed to dry before transferring. Then, if in a hurry, strip, and dry before the fire, and you can astonish a client with a perfect carbon print, mounted and complete in a very brief space of time, about two hours. This I may call the Salisbury Express C.D.V.; but, of course, I describe this experiment only to show what speed is possible, and that reticulation is not a consequence of rapid drying of sensitized tissue. I do not recommend hurry of any sort as desirable in photographic printing; but I wish your readers to note that I claim great advantages by transferring as you go along. Don't fix, dry, and transfer; but avoid the drying. You have more perfect results this way, and into the bargain it has practical convenience. You can strip all the plates of a morning, and have them all ready for the first batch of prints of that day. I find the practice so easy, and only a little more costly than silver, that I am now giving up the latter for portraits entirely, and I find the change quite easy, because my own wishes are seconded by the public taste. I have only to place before my customers specimens of chromotypes and silver prints from the same negatives, to say the former will not fade while the latter cannot be guaranteed, and forty-nine out of fifty of my clients elect to take the chromotypes at the higher price. And certainly, besides the permanency, the chromotypes are more brilliant and more uniform in colour and in tone than is possible to silver.

With regard to "full gloss," I have an idea that this would be facilitated by having a much thicker transfer

paper, say three or four times thicker than the ordinary double transfer. With summer weather coming this would quite easily dry, and if not found thick enough for use as a C.D.V., it would be easy to mount on thin card with glue or india-rubber solution, which would not penetrate the three or four thicknesses of the paper, and consequently the full gloss would be preserved to the satisfaction of the customers who desire it. I do not like it myself, but I do not ask my customers to adopt my own standard of taste. "Variety is pleasing," is an old text copy I remember; but I think the Autotype Company will do well to consider my suggestion of a thick double transfer paper for the special purpose indicated.

I have some other ideas on trial in regard to chromotype printing, which, when my experiments are completed, I will at all events give to chromotype licensees through the medium provided by the Autotype Company. Carbon printing is now a commercial question, and outsiders are not entitled to expect gratis what others obtained by purchase and experiment.—Yours truly,

C. J. WILKINS.

Salisbury April 3rd.

ARTIFICIAL LIGHT.

Sir,—The plan for an artificial light, sufficiently actinic for photographic purposes by means of a candle of phosphorus and nitrate of potash is interesting and ingenious. I regret I have not time to experiment in the direction thus indicated.

The idea, however, I may observe, seems to me very incomplete. One capital difficulty is, I fear, overlooked. When phosphorus is burnt in air or oxygen, the product of the combustion is, of course, phosphoric acid PO_4 . This new resulting substance is given off in the form of a very dense white acrid vapour, which rises round the burning phosphorus, surrounds the flame, and rapidly obscures it, and subsides but very slowly.

Before phosphorus could be utilized in the manner suggested, these objectionable fumes of PO_4 must be got rid of by drawing them off from the source of light. I fear that this would not be very easy, on account of their great density. At all events, the phosphorus candle would demand some sort of lantern and draught apparatus, and could not be used in the simple manner apparently suggested.

H. WILSON.

THE CYANIDE CURE FOR THE BATH.

Sir,—I certainly must speak out respecting the management of the silver bath, which was made the subject of a paper read at the Photographic Society last month by Mr. John Spiller, F.C.S. While not depreciating his labours to give some definite information respecting the treatment of the nitrate of silver bath, I must certainly claim to be the first person who discovered the use and addition of that chemical—cyanide of potassium—as the regenerator of a non-acting silver bath. And although at the time the then Editor of a contemporary (G. D., M.A.) protested and said it was rubbish, and was against theory. Major Russell tried it and said, "Theoretically it may be wrong, but it answers in practice." This is quite sixteen years ago—long enough to be forgotten, I admit, and of quite sufficient importance to be brought forward again. But you, yourself, published the communication in the *Photographic News*, and also referred to it in the *Year-Book*. A paper was also read by me at the Sheffield Photographic Society meeting, giving the whole of the procedure by which a truant bath could with certainty be made at once to return to its duty, and furthermore produce pure and brilliant negatives; and I shall be happy to supply in your next *Year-Book* the whole of the *modus operandi* by which any photographer can be absolute master of his bath. No pay required (you can't have anything cheaper than for nothing); no pinkies or any other annoyance after the treatment; nitrate of baryta not wanted.

I really begin to think that half the novelties are old things *hatched up again* slightly changed, not in fact, but just in a word or two, and are then claimed by some one who wishes to speak at all the meetings, be on all the committees, be on the councils, great inkling for vice-presidency, or hopes, by continual producing the output of others' brains, to be a president in time; never agree with any one, so that they can have a letter controversy in one journal or the other.

If necessary, I will try and look up the paper on the curing of the silver bath, or if you think it would be interesting to your readers, I will state the way restive baths are manipulated by yours respectfully, J. SEARS TULLY.

[We shall have pleasure in receiving our correspondent's communication. He was undoubtedly the first to propose the cyanide cure; but he overlooks the fact that we noted this in our article on the subject on March 16th, the Friday after Mr. Spiller's paper was read.—Ed.]

WASHING NEGATIVES.

MY DEAR SIR,—I send you a few lines concerning a little contrivance I use daily for washing my negatives after fixing, and as I have found it very useful in my daily work, I dare say it may be handy to your numerous readers. It is this:—A small square earthenware pot, with holes in the bottom and two on each side, for the insertion of string for the negative to rest on during the operation of washing. After the negative is fixed, I place it across the strings, put the pot in a sink, and turn on the water tap, and the negative always has a continuous stream of fresh water, as the holes in the bottom answer as a syphon. The price is, I think, ninepence for a pot which can take a five by four glass plate.—Yours very truly, C. R. P. VERNON.

LICENCE FOR CARBON PRINTING.

DEAR SIR,—Will you kindly permit us briefly to reply to the letter of Mr. Elliott, in your last issue, relative to the necessity of a licence for the practice of Autotype printing?

We beg to refer him to an advertisement from our solicitors, and to say that, sorry as we should be to disturb the good understanding that has existed for so long a time between the photographic profession and ourselves, we shall certainly take proceedings against any person or persons manufacturing tissue for photographic purposes, or offering for sale, or using such tissue (not being our manufacture), or employing the double transfer processes, without our licence or consent during the duration of our patents.—Yours most truly, THE AUTOTYPE COMPANY.

COLOUR OF CARBON PRINTS.

SIR,—I do not know what "Carbon Worker" means by saying I am a "Bogus Nemesis," nor should I have thought it necessary to explain even to him that I am not the "genuine daughter of Nox." Not content with setting himself up as an arbiter of taste in the matter of the colour of carbon prints, he now seeks to become a dictator in the matter of *noms de plume*. "Carbon Worker" says that he never set up his dictum as a standard of good taste, that he limited himself to pointing out the fact that Lambertype-purple was not a colour selected by artists for their monochromes, &c. But "Carbon Worker" did not so limit himself. He wrote, "The colour is not really good in any sense." If this is not a dictum I do not understand the meaning of the English language.

"Carbon Worker" makes a great point about some sort of secrecy which, according to him, attaches to the Lambert patents. If "Carbon Worker" knew anything about the matter, he would be well aware that in the practical working of these patents, modifications of treatment and improvements in details are suggested and incorporated from time to time. The Autotype Company have established a monthly journal which they send gratis to licensees, and in

which appears any novelty or improvement that may have been found practicable and useful. For their own interests the Autotype Company would look especially after their licensees, would endeavour to smooth their difficulties, and ensure their successful working. Surely they have just as much right to do this as to offer a commercial or any other advantage to those who are willing to become licensees under their patents.

"Carbon Worker" begins his letter by "calling names," and finishes it in a similar strain. For the future let him stick to facts, and learn some moderation in the expression of his opinion, that there may be no occasion for a request from NEMESIS.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting was held in the Water-Colour Gallery, Pall Mall, on the evening of the 3rd instant, Mr. J. GLANVILLE, F.R.S., in the chair. The minutes of a preceding meeting were read and confirmed.

CAPTAIN ABNEY, F.R.S., read a paper describing a method of intensification which was one of the best he had tried. It consisted in treating the negative first with bromide of copper, and following that with alkaline development, or with the application of nitrate of silver. The method had been brought under his attention by Mr. Warnerke, who had obtained it from the PHOTOGRAPHIC NEWS.

MR. WARNERKE, in response to an invitation from the Chairman to speak, disclaimed any credit for the process. He said: The honour Captain Abney offers me by coupling my name with the valuable investigation he made I cannot accept. I simply followed literally the formula given by the PHOTOGRAPHIC NEWS, after *Anthony's Bulletin*. However, I consider the subject of great importance, and on the invitation of Captain Abney I brought with me the result of my experiments, which illustrate well various reactions mentioned before this meeting. First is a stereoscopic negative with one of the images intensified by the described process. It will be remembered that to produce this result the photographic image is first submitted to the action of sulphate of copper and bromide of potassium, which makes it white, and blackened afterwards by the application of silver nitrate. I tried what would be the action of other metallic salts on the whitened image, and my second illustration shows that most powerful blackening action of the sepia colour is produced by nitrate of silver; chloride of gold and chloride of palladium, less intense cold black tones; still less intense—scarcely perceptible—is action of chloride of tin; while platinum chloride, lead nitrate, antimony chloride, ferricyanide of potassium, iron sulphate, iron perchloride, bichromate of potash, pyrogallol acid, permanganate of potash, uranium nitrate, have no action perceptible. Sulphantimoniate of soda renders the image red. Alkaline pyrogallol acid also blackens it. My next illustration, where the whitened image was acted on by pyrogallol acid with caustic potash, by nitrate of silver, and by ammonia hyposulphuret in three different places, demonstrates that nitrate of silver gives by far the most intense image, of very non-actinic sepia colour; alkaline pyrogallol acid, soft black grey tones, similar to the ordinary negative; hydrosulphate of ammonia, the image of light brown, tint more intense than pyrogallol acid. In every case the whites are preserved quite clear and transparent. All three methods are decidedly useful, and can be used with advantage. Having thus far found that nitrate of silver gave results better than the metallic salts, I tried chlorate of silver, sulphate, and solution of oxide in ammonia, with following results:—Nitrate the most intense, next to it chlorate, sulphate no action; ammoniacal salt a little blackening, but very unsatisfactory. My last illustration is of the action of various re-agents in the image blackened by nitrate of silver, with the following results:—Strong nitric acid destroys the blackness, but it remains still a whitish-grey image; strong sulphuric and hydrochloric acids produce no action whatever; ammonia hydrosulphuret blackens the image still more; cyanide of potassium weakens the black image, but not considerably, remaining image of still greater intensity having a purplish-black colour; iron perchloride destroys the black colour, leaving the image of a pure pink colour; ammonia has no action; hyposulphite of soda has a very feeble action. Having learned from Captain Abney's analysis that the black part forming the image is a compound of silver and bromine, I cannot omit to point out how widely different it is in appearance and

properties from the familiar white or yellow bromide of silver: (1) it is intense black; (2) it is insoluble in cyanide, ammonia, and hyposulphite of soda.

Mr. W. BEDFORD asked if the results obtained by this method were stable, as it appeared to be somewhat analogous to the mode of intensifying with mercury and sulphide of ammonia, which was not stable.

CAPTAIN ARNEY said that was a mistake; it was not analogous. In the method he had described the final result was metallic silver. In the method to which Mr. Bedford referred the final result was a salt of mercury.

Mr. WARNERKE pointed out that the black image obtained was not, as he had explained, affected either by strong acids or ammonia; and if it was unchangeable by strong re-agents, which an ordinary negative could not resist, it was clear that the treated image was more stable than an ordinary negative.

After some votes of thanks,

The CHAIRMAN said they would now proceed to the adjourned debate on the bath, and called upon Mr. Dallmeyer to open it.

Mr. DALLMEYER said he did not intend to enter into the discussion on the bath, but simply to place under the attention of readers some examples which would interest them as having some indirect bearing on the subject. Having, in common with others, heard much on the subject of the photographs of Kareline which had taken the first prize at Edinburgh, he sent to his agent at St. Petersburg, and asked him to obtain some specimens, and also any information he could. The specimens he would now place before the meeting; the process, he regretted to say, Mr. Kareline kept secret. It would be noticed that there was great depth of focus, all the figures in large groups being well defined. He came to the conclusion, from examining the pictures, that a small aperture was used: probably a lens of about twenty-four inches focus, and an aperture of about one-ninth. As all the figures seemed to have sat quite still, it would appear that he used a rapid process to secure such results with a small stop. Mr. Dallmeyer also passed round some groups taken with his D lenses, and also with the rapid rectilinear and wide-angle landscape lenses. He referred to Mr. Warren De la Rue's very rapidly taken image of the moon as having been produced by the aid of a perfectly neutral bath—a condition Mr. De la Rue laid much stress on. He noticed that present in the meeting was M. Boissonas, of Geneva, who had invented a process from four to eight times quicker than the usual method.

Mons. BOISSONAS, in response to an invitation from the Chairman, showed some albums of specimens, consisting of varied groups, and of children laughing and crying, and animals, all showing very great rapidity of exposure. He remarked that he could not of course speak of his process there, but the examples would show that it was rapid. He used for cards a Dallmeyer lens, and for the large pictures a French lens.

Mr. YONK said: Before Mr. Spiller replies, I should like to state the results of a few experiments I have made since the last meeting. I am rather sceptical about the sulphate of silver theory as to the cause of pinholes, being unable to account for the introduction of sulphuric acid into the silver bath. Dr. Vogel traces it to the supposed contamination of the sensitizing salts with sulphate of potash. I think the manufacturers of collodion would not be likely to use commercial preparations, but those specially prepared for photographic purposes. Mr. Sawyer puts it down to the sulphuric acid used in the manufacture of the pyroxyline. I think that manufacturers of collodion, knowing the destructive properties of a free acid in this preparation, would take the greatest precaution to eliminate every trace before converting it into collodion. Nitrate of baryta, when added to an exhausted bath, produces a white precipitate. It is a most reasonable conclusion to arrive at that this precipitate is caused by the presence of a sulphate. My experiments tend to show that a bath purposely saturated with sulphate of silver, which gives a marked precipitate with nitrate of baryta, does not give pinholes, but works in the most satisfactory manner. The plates produced are examples. The bath used was one which gave pinholes in abundance, until renovated by the addition of nitrate of baryta. No. 1 is the bath treated with sulphate of potash: the result is a mottled sky, similar to an over-sensitized collodion. No. 2 is another portion of the same bath treated with sulphate of soda: the result is similar, but not quite so objectionable. I then precipitated the sulphate of silver with nitrate of baryta, and No. 3 is the result, a most desirable negative with a clean sky. I then saturated the bath with pure sulphate of silver, precipitating all the nitrate of baryta; the resulting negative, No. 4, is also satisfactory, with an entire absence of pinholes. We may conclude from this that nitrate of baryta acts the part of a sanitary inspector by re-

moving the objectionable matter, and that sulphate of silver removes the excess of nitrate, thus rendering the bath comparatively pure as regards the barium salt used in correcting it. From these experiments it is important to use pure sulphate of silver, and not to generate it in the nitrate of silver-bath by the addition of sulphate of soda or potash.

Mr. W. BROOKS had obtained greater rapidity by at least four times than usual by using an alkaline bath. He took a mixture of old baths which were out of order, and added carbonate of soda until a very definite precipitate was produced. He then boiled the bath, and afterwards added a little nitric acid, still preserving it alkaline, merely adding acid until it gave a clear image, which it did long before it showed acid reactions. It was then exceedingly rapid. The alkaline bath used by Mr. Eliot practically ceased to be acid when collodion with free iodine was immersed. He used his alkaline bath with commercial collodion in usual good working condition.

Mr. SPENCER had read Mr. Spiller's paper before the last meeting with much interest. Regarding the source of the sulphate of silver, he thought it was ~~usually~~ likely to be introduced by means of imperfectly washed pyroxyline, as the presence of sulphuric acid would be shown at once in adding the iodides to the collodion. Neither did he think much would be added by impure iodides. It was most likely to be introduced in nitrate of silver. He liked the idea of using salts of barium in the collodion, and should recommend the bromide as the most easily soluble.

Mr. WARNERKE had found the bromide of barium very difficult to dissolve in alcohol. He used it in emulsions because there the same difficulties did not exist.

Mr. SEBASTIAN DAVIS referred to Mr. De la Rue's remark about neutralizing, and thought that his experiment was made when pyrogallol acid development was in vogue. [Mr. Dallmeyer: No.] Mr. Davis continued that with iron development a much larger share of acid could be used in the bath with advantage. Regarding the pinholes, he referred to a former discussion, when it was agreed that the presence of iodates in the bath was a primary cause. He then referred to the advantages of a simple volumetric method of testing the silver bath, as the method by specific gravity was not trustworthy.

Mr. BLANCHARD thought that the pinhole trouble was a growth of the last four or five years, and from some recent information he learned that during that time much of the silver used by photographers had come from a fresh source, and contained traces of other metals difficult to eliminate, such as palladium. To this cause, it seemed to him, the evil might be traced.

Mr. BROOKS thought these holes might often be traced to the use of methylated spirit in collodion and in developers.

Captain VERNY hoped the discussion would not close without a few words from Mr. Thomas, whose baths were so excellent.

The CHAIRMAN said it would be desirable to still further adjourn the discussion, and then possibly Mr. Thomas might take part in it. He now adjourned it until the next meeting, May 8.

The proceedings then terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE "popular evening" of this Society was not commenced this year so early as usual in the season, on account of the many transactions connected with the late Exhibition. The first lecture was delivered by Dr. John Nicol, in Queen Street Hall, on Wednesday, 28th ult. The pictures consisted of a very fine series of transparencies by Messrs. G. W. Wilson and Co., of Aberdeen; and, in spite of a very rainy night, there was a large audience.

Dr. NICOL stated that the subject of exhibition was suggested during a pleasant trip made by the Treasurer and himself to the "Granite city." He spoke in the highest terms of the city and its inhabitants. Among the chief objects of interest were views of Dunottar Castle, and two views of the city from the chain bridge. These were followed by a large series of pictures of the principal streets and buildings, the famed "Brig o' Balgonie," Inverogy, and Ravenscraig castles. Then, returning by the Bridge of Dee, a series of fine pictures of the district known as "Deeside," extending from Aberdeen to above Ballater, was exhibited—when Dr. Nicol's remarks were suddenly brought to a close in consequence of the gas refusing to do further duty. A small leak had taken place in the gas bag, which had not been in use for a considerable time. Such accidents will occur, even amongst the best regulated.

If late in beginning, the "popular committee" seem to have lost nothing of their old zeal, as they have issued tickets for the 11th inst., when an exhibition of "The Arctic Expedition under Captain Nares" will take place.

Talk in the Studio

PHOTOGRAPHS OF "CELEBRITIES."—It is said that among the number present at the execution of the Mormon Lee was a photographer, on observing whom, preparing to take a photograph of him, the prisoner observed: "I want to speak to that man. I want to ask a favour, sir. I want you to furnish each of my three wives with a copy of the photograph." As a further specimen of photographic enterprise in the portraiture of "celebrities" may be recorded the case of William Stevens, known as the Buckinghamshire giant, for whose photograph, taken two days before his death, a large sale is anticipated among those whose extraordinary taste led them to supply him freely with the food and drink which, no doubt, caused his comparatively early death at the age of 49. He was, it seems, about 5 feet 10 inches high, and weighed 35 stone.

A PHOTOGRAPHIC KORAN.—At a time when preparations are being made for a Caxton celebration, and for commemorating the four hundredth anniversary of the introduction of printing into this country, an instance arises, strangely enough, which shows us that there are still branches of literature that the art has failed to assist in spreading. The Koran, according to the Mohammedans, must never be printed, but always appear before the Faithful in written characters, a circumstance which has stood in the way of its very general dissemination. Every copy of the sacred book is produced in the same way as copies of other writings before Caxton set up his press in this country. From Germany, however, the news comes to us that the time-taking and laborious work of making copies of the Koran in manuscript has at last come to an end. Although type and the compositor's frame are forbidden, there is no such prohibition against the employment of photography for the purpose, and it is to this art, in preference to that of Caxton, that high Mohammedan functionaries have turned to solve a difficulty under which they have laboured for some time past. Here there is no transposing of the writings into modern characters, or setting them by having recourse to type and letters which were unknown at the time of the great prophet. As in the copying of the Domesday Book, the Utrecht Psalter, and other rare works, the original need merely be set up against the light, in order to be copied trustworthily and truthfully with the camera, the photograph obtained being subsequently transferred to stone or zinc by any of the well-known processes at present in existence. Once properly transferred in this way, the image may be multiplied and copies struck off as rapidly and as plentifully as in the case of ordinary lithographs or zincographs. As regards the special reproduction of the Koran in this manner, the most stringent measures have been taken by those under whose direction the work is proceeding to prevent anything that might be considered as a desilement of the ancient document. The art of photography applied in this manner is of such a nature that the chances of introducing extraneous matter are in the highest degree improbable.—*Daily News.*

LETTS, SON, AND CO., Limited, whose name as publishers of diaries has for so long been associated with the Royal Exchange, have removed to No. 33, King William Street, London Bridge.

To Correspondents

IGNORAMUS.—You are entirely under a mistake as to the origin of carbon printing. Mr. Fox Talbot never made any attempt in that direction. The discovery of the principle upon which carbon printing depends was made by Mr. Mungo Ponton, in 1839. He discovered the sensitiveness of paper treated with bichromate of potash. Fox Talbot applied this principle to the invention of an engraving process. M. Poitevin applied it to carbon printing, and patented his process in this country in 1856. Many others worked in the same direction, but they failed to secure half-tone in the prints. It was reserved to Mr. Swan to discover a practicable method of producing carbon prints with half tone, in 1864. A patent once secured is at first granted for three years; at the end of that time, on payment of certain stamp duties, it is extended for four years more; and at the end of this time, on further payment, for seven years more, making fourteen years. It then expires, unless the patentee petitions Her Majesty for a further extension, which, under some conditions, is granted for seven years more. Your print produced on tissue, made ready sensitized, and kept for three months, is very excellent. Without the publication of Mr. Swan's invention the production of such a print would have been impossible.

J. H.—The best glass for studios is the whitest. The Belgian sheet, which is the cheapest, is also very colourless, and is the glass we should use.

STEREO.—The coating of paraffine inside your tub will not be injurious to the prints. 2 You may produce stereoscopic pictures by means of one camera. To do this efficiently and satisfactorily use Latimer Clark's parallel bars, which permit the camera to be moved without disturbing the focus or altering the position of the image on the ground glass. The arrangement you propose, of moving the lens through a slit in the front of the camera, would not answer well, and would give too little variety in the angles for stereoscopic effect. 3. We cannot tell you where you can purchase lenses for a stereoscope. Try any optician.

C. WILSON.—We have no means of forming an opinion of the state of trade amongst portraitists in Australia, or of the openings for a portraitist. We have no doubt that openings exist for good men.

J. P.—In proceeding against a person for piracy of your works, your best plan is to place the matter in the hands of a respectable attorney, who will take the necessary steps. A summons must be issued against the infringer by a magistrate, who will grant it on sworn information. The complaint must be brought under 25 and 26 Victoria, cap. 68. Your attorney, or his agent, can obtain a certified copy of the registration by application at Stationers' Hall, stating date and details.

FLORENCE.—There is no reason why your silver bath, made twelve months ago, should not work perfectly. 2. One of the simplest and most efficient dry processes you can try is the coffee process, described in several articles in our last volume by a correspondent at Ouchy. You will find the process in a complete form in our last YEAR-BOOK. It is simple, and the results excellent. 3. The liquid glue in question is said to be made by boiling a good sample of ordinary glue for some time, and adding a few drops of nitric acid. Then cork up in bottles.

F. RICHARDSON.—We have often recommended operators not to send their specimens to unknown persons. As a rule, we know nothing of advertisers to whom communications are to be addressed at our office. They send their announcements, and call and receive replies. The most common reason why specimens are not returned is the absence of a stamped and addressed envelope in which they may be returned.

AMATEUR.—We have published many articles on the production of collodion transfers, both in the NEWS and in our YEAR-BOOKS. You will find some details in our YEAR-BOOK for 1872, page 97, and in various other of our YEAR-BOOKS.

A. P.—The statement that no licence is required is untrue and misleading. The processes, being protected by patent, cannot be practised without the licence of the patentee. If the statement be meant to imply that the patent is not valid it is of no value, but merely an *ex parte* expression of opinion. Possibly it is meant to imply that no licence is required for taking lessons; but in that case, since a licence would be required for practising the processes, the statement is misleading. Possibly it is meant to imply that no licence is required for teaching; in which case the statement is practically without meaning. See announcement by Autotype Company in our advertising pages.

J. W.—Allow the paper to float on the silver bath about three minutes. This is a matter which varies with circumstances, which you will understand better as you gain experience. A saturated solution of anything is as much added as the liquid will dissolve. For instance, one drachm of ordinary carbonate of soda will make a saturated solution if added to a drachm and a-half of water; or if bicarbonate of soda be used, one and a-half ounces will make a saturated solution of 12 ounces of water. A 20-grain solution of the common carbonate will serve for treating the blotting-paper.

ARAX.—The cause of your failure is in the quality of the pyroxyline. Neither sample has been suited for making collodion. If your solvents were insufficiently rectified, the presence of water would increase both the defects you name. But the opalescence and the glutinous quality are common faults of a bad sample of pyroxyline, generally of a sample made at a low temperature. It is difficult to advise a remedy, inasmuch as in our experience it is difficult to purchase good samples of pyroxyline. We have generally found it desirable to prepare our own. We have repeatedly given formulae for its preparation, especially in back YEAR-BOOKS.

W. SPILSBURY.—Notification of the receipt of P.O.O. was duly forwarded.

W. R.—No credit was given at the time. Of course we shall not notice such a person.

THOMAS GAFFIELD.—Many thanks for papers duly received. We have already made some extracts on the subject, and shall probably make more.

P. G. A. (Kewick).—We have examined the mounting board, and see no reason to doubt its fitness for photographic mounts. The spots on the prints are very perplexing, and very difficult to trace to a certain cause, as similar spots arise from various causes. Particles of the bronze powder used in "gold" printing names and addresses produce very similar spots: impurities in the washing water yield similar results; sometimes the burning of a coke fire in the printing room, giving out sulphurous particles, will produce a similar crop of spots; sometimes a defective sample of albumenized paper, especially if it have been kept for a few months in a damp place.

Several Correspondents in our next.

The Photographic News, April 13, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AND THE HEALING ART.—WHAT TO DO WITH HARD LANDSCAPE NEGATIVES.—THE PLANET VULCAN.

Photography and the Healing Art.—Medicine and photography have much in common in respect to the materials employed in their pursuits. Collodion is eminently useful both to the medical man and the photographer, and is at the same time rarely employed by anyone else. If statistics in the collodion manufacture were collected, we doubt not that these would show that the material was almost exclusively used in surgery or photography. Although a product but recently discovered, it is one now of the most important materials employed by the photographer and the surgeon. Another case may be cited almost parallel. Bromide of potassium, which was so little known and used fifteen years ago that the imports into this country amounted to but sixteen pounds' weight in the year, has steadily increased in favour—both as a medicament and as a photographic chemical—that, at the present moment, no less than one thousand six hundred pounds of the salt are annually introduced into Great Britain, while other large quantities are manufactured in England itself. We need not point out to our readers the value of bromide of potassium in photography, for the salt is too well known to need any explanation on our part. Neither need we allude to the increased use that has been made of the compound during the past two or three years, since the introduction of alkaline development and the preparation on every hand of bromide emulsions. In medicine the salt has been received with the same favour. In cases of epilepsy it works wonders, and is administered by all medical men now-a-days with considerable confidence. In the same way as iodide of potassium has proved beneficial to eradicate stubborn influenza, and to promote secretion in the tissues, to benefit our seeing and hearing faculties so the administration of bromide proves efficacious in epileptic disorders. Following in the wake of the photographer, who did not hesitate to essay the effects of a bromo-iodide in his work, and thereby combine the good qualities of both salts, medical men have now had recourse also to bromo-iodide of potassium, employing the double salt for cases of goitre and other similar diseases. Balard, the late president of the French Photographic Society, and discoverer of bromine, who died during the past twelvemonth, lived long enough, fortunately, to see the benefit his discovery had conferred upon his fellow men. When he first made known to the world fifty years ago that he had found out another chemical element, it seemed as if, but from a scientific point of view, the discovery was all but useless. When a young man at Toulouse, he noticed the formation in some disused salt pans of a salt which turned out to contain a new element, and it was in investigating this new element bromine and its compounds that the great French chemist spent most of his life. Had he paused, like some might have done, to ask of what good the whole discovery and investigation might be, photographers and medical men would not at this moment be in possession of a most valuable compound; for it is but recently, as we have seen, that any extensive use of the salt has been made. It is gratifying to think that M. Balard lived to see the fruits of his labours fully appreciated.

What to do with Hard Landscape Negatives.—One of the late M. Constant Delessert's hints in regard to landscape photography may well be revived for carbon work. That clever experimenter exhibited at Paris, some eight or ten years ago, a series of landscape pictures rather larger than cabinet, and printed upon salted drawing paper. Not only was the surface rough, as in the case of Whatman and similar sketching papers, but it was, moreover, tinted from cold grey and green, in some instances, to a warm rose in others. The effect of lake and mountain pictures printed upon a

rugged tinted surface was, in many instances, very agreeable, and some of M. Constant's photographs had all the effect of little sepia or water-colour sketches. The rough texture of the paper broke up any monotony where this might exist, and, especially in the skies, had a most pleasing effect. M. Constant employed both plain salted paper and also paper prepared by the shellac process, in producing these little pictures, and selected his tints according to the nature of his negatives. To amateurs more especially is the use of tinted paper to be recommended where the negatives happen to be somewhat hard and the high lights otherwise too glaring and chalky. In employing the carbon process it must be the transfer paper that is tinted. But, in any case, the tint employed must never be deep, and care in mounting and framing must be exercised, so as to heighten, and not degrade, the result. In the case of indifferent negatives, much more pleasing pictures may be secured by such a method of printing than by having recourse to perfectly white paper in making the prints.

The Planet Vulcan.—Photo-astronomers, having been called upon throughout the length and breadth of the globe to adduce testimony for or against the presence of a new planet, which has already received the name of Vulcan, seem to have afforded negative evidence. For some time past the existence of Vulcan, a planet supposed to revolve around the sun, inside Mercury, has been discussed, and in France a good deal of credence has been felt on the subject. The eminent French astronomer, M. Janssen, has for months past been watching for the expected planet, and arranged his automaton *revolver photographique* with a view to securing proofs of its existence. Marks of one kind and another have been found to appear upon the sun's disc, which French astronomers avowed were not spots, but a recurrence of this planet, and as it was asserted that on the 22nd of March the planet would again make its appearance between the earth and the sun, photo-astronomers of all nations were asked by the Academy of Sciences to take as many photographs of the solar orb on that day as possible. Sir George Airey, the Astronomer-Royal, as the British representative of men of science in this country, particularly urged that the request of our French brethren should be complied with; but the 22nd has come and gone without anyone having observed the long-looked-for planet. We fear, therefore, that its existence is only to be found in the sanguine imagination of our French confrères, and that we must still be content to number Vulcan among other well-known myths. Whether the phenomenon that has been taken for it is an ordinary spot on the solar disc is, however, another matter; but it is one which will doubtless very speedily be solved by the aid of photo-astronomy. In fact, in the branch of science appertaining to the study of our heavens, the help of the camera is now almost indispensable. Optical observations may do much in confirming or reconnoitring; but for adverting absolute proofs of this or that phenomenon there is nothing like the sensitive plate. All recent study of the sun, of its photosphere, its corona, and protuberances, has been rendered more accurate and trustworthy by the aid of the camera, which has permitted researches such as could not have been conducted without its aid. The establishment by the French Government of a photo-astronomical observatory at Meudon, to which we recently referred, in an additional proof, if any were wanted, of the great value of photo-astronomy.

FRENCH CORRESPONDENCE.

THE DRY-PLATE COMPETITION IN PARIS.—AWARD TO M. CHARDON FOR AN EMULSION PROCESS.—THE SILVER BATH CONSIDERED THE SOURCE OF FAILURES IN PRACTICE: ITS SUPPRESSION.—M. BOIVIN'S FORMULE AND PROCESS.—BLETTES OF ALBUMENIZED PAPER.—ADDITION OF AMMONIA TO THE FIXING BATH.

IN the course of the year 1876 the French Photographic Society instituted a competition among photographers

for the best dry collodion process uniting rapidity with all the other qualities which go to make a good cliché. The author who obtained the prize was to give the description of it in every particular, so that the method might subsequently be given to the public. The competition closed in December last, and the result of the jury was made known in Paris last Friday evening. Only three competitors presented themselves. Their processes were put to a practical test, at the end of which only one was found to fulfil the conditions of the programme. The method was one proposed by M. Alfred Chardon. On the same evening, after the report of the jury had been read, the successful competitor gave an account of the process, and demonstrated the working of it before the members of the Society. As M. Chardon himself admits, the process has nothing new in it actually. The improvements he has effected consist in defining the proper proportions of ingredients to be employed, in the happy application of the reactions produced, and in the singular care that has been taken in the preparation of the various compounds. Without entering into details, which will be found in *extenso* in the report that is to be published shortly, I may say that the method in question is based upon the employment of an emulsion which is dried after it has been prepared, being re-dissolved at any time when it is necessary to undertake the preparation of plates. This emulsion contains bromide of ammonium, bromide of cadmium, a bromide of zinc, and, after having been sensitized, it is freed from all excess of silver. The different manipulations necessary in the preparation of the two collodions that are mixed at a certain moment, the dissolution of the nitrate of silver and its addition to the collodion, the process of drying, and the second solving of the emulsion—all these are a little complicated; but it must be admitted that, on the other hand, there is no preparing of a preservative of any sort, this being altogether suppressed in M. Boivin's method. The exposure necessary is but twice that necessary in the case of wet plates. The development is alkaline (carbonate of soda and bromide), with pyrogallie acid to finish with. In a little while I hope to send your readers full details.

The success of M. Chardon will, necessarily, produce in this country a disposition in favour of emulsions, which till now, has had but few disciples here. M. Boivin, whose name, I am sure, is familiar with the readers of the PHOTOGRAPHIC NEWS, and who is one of my own collaborateurs, has been for some time past one of the most earnest advocates for the suppression of the nitrate of silver bath. He attributes to the latter (not without reason) the greater part of the accidents and failures which happen in everyday practice. He has recently sent me a description of the emulsion process which he now employs both for wet and dry work with equal success. The collodion is compounded in the following manner:—

Water*	...	...	60 cub. cents.
Alcohol	...	...	40 to 50 "
Pyroxyline, prepared at a high temperature	...	...	1.50 grammes
Bromide of zinc or ammonium	...	...	1.50 "
Bromide of uranium...	...	...	1.50 "
Chloride of barium...	...	...	0.10 "

The collodion, after standing for some time, is filtered and poured into a bottle containing four grammes of white fused nitrate of silver dissolved in a little water and alcohol. The bromide of silver formed thus, in the presence of an excess of silver, is much more sensitive than when it is formed in the presence of an excess of bromide. The mixture is allowed to stand for some days, taking care to shake it up from time to time, and it is filtered through cotton wool. The bottle containing the emulsion must be preserved in the dark. Before using it should be shaken up, and then permitted to stand for ten minutes.

* No ether is mentioned.—Ed. P.N.

The emulsion collodion must be poured upon the plate in a rather more liberal manner than is the case with ordinary collodion, and the glass should be kept a little longer in its horizontal position. When the film has well set, the plate is plunged into a bath of rain-water, and when taken out, it is rinsed by the aid of a wash-bottle. If you are not going to use the plate at once, it is treated with an organic preservative, and allowed to dry.

In order to develop, M. Boivin pours into a quarter-plate bath sufficient water to cover the plate, and adds to it three drops of ammonia, and five drops of a ten per cent. solution of bromide of ammonium. The plate is plunged into this bath for the space of a minute, and then five drops of pyrogallie acid are added (10 parts of acid dissolved in 100 parts of alcohol), the liquid agitated, and the plate again treated. The image appears after the plate has remained immersed for a little while; first of all the pictures appears by reflection, then disappears, and afterwards is seen as a transparency.

In warm weather, and when the exposure is long, it is necessary to augment the amount of bromide added; it is diminished, on the other hand, in winter, and when the exposure is short. According to M. Boivin, the bromide plays here the same rôle as acetic acid in the ordinary developer. The ammonia is the active agent, while the pyrogallie acid is simply the reducer.

If the image has a tendency to become fogged, it is necessary to add a few drops of the bromide solution; if details are wanting, then some more pyrogallie acid is added. When the image is perfect seen as a transparency, but a little weak, it is well washed first of all in pure water acidulated with a little acetic acid to remove all trace of alkalinity, and finally it is intensified with pyrogallie and silver. Finally the image is fixed with hyposulphite of soda.

In general, the formulæ given are only employed by M. Boivin when working with wet plates, the silver bath and its attendant inconveniences being in this way obviated. But in the case of dry plates, the first part of the preparations being capable of being made in the studio, he prefers to employ the same collodion as above, sensitized in a silver bath of fifteen per cent. strength, with 0.50 per cent. of nitrate of uranium. He proceeds then as in the case of an emulsion, except that after washing the plate he passes over the film a solution of chloride of barium, made by dissolving one part of the latter in 1,000 parts of water. Another rinsing with water succeeds, and then the preservative is applied. The rapidity in this case is greater than with the emulsion, and the clichés are finer.

Apropos of the means indicated by M. Andrés to prevent the formation of blisters in albumenized paper during the last washings (a method of which I made mention in my last letter), I may refer to another, which is more simple still, and which is made use of by some of the best known of our portraitists—MM. Walery, Nadar, Disderé, Lumière, of Lyons, &c. It is as follows:—The fixing bath is reduced to eight or ten per cent. of hyposulphite of soda, and there are added five grammes of liquid ammonia per litre. The manipulations are precisely the same as usual, and the results are excellent. Nevertheless it seems to me as if the final tint of the prints must be changed by the action of ammonia, a matter that renders some modification of the toning bath necessary.

ERNEST LACAN.

PORTRAITS IN WATCH GLASSES.

A PORTRAIT which is acquiring considerable vogue in the United States at present is described in *Anthony's Photographic Bulletin* as follows:—

"Take an unmounted rather strong print, and trim the same somewhat smaller than the convex glass to be used; wet it thoroughly in clean water, and then lay it face up on

a sheet of glass, blotting off the water; then brush over it a stiff paste, made out of gum tragacanth, and apply the same also on the inside of the convex glass, which ought to be carefully cleaned with ammonia; then lay the print on the glass, and on the top of the print a piece of smooth, tough paper, and rub out all the paste and air-bubbles with an ivory or bone paper-folder, the upper edge of which must be curved corresponding with the shape of the convex glass; the edge must also be sharp and smooth. Always work from the centre, using slight pressure, and frequently change the smooth paper on the back, which serves to protect the print from getting scratched and torn. After the print is perfectly mounted without showing either wrinkles or blisters, let it dry thoroughly, but spontaneously. Then grind the paper a little with fine sand paper, and immerse it in a small tin pan containing molten spermaceti (a good plan is to have the pan fitted into another pan holding a water bath, in order to just keep the spermaceti in a molten condition without heating it too much, in which case it would affect the albumen of the print, turning it into a nasty yellow that will spoil it entirely). It will only take from ten to twenty minutes to make the print perfectly transparent; then take it out of the spermaceti and let it cool off, and with a coarse rag rub off all the surplus spermaceti, laying the glass on a small cushion to avoid breaking. Now the picture is ready for painting. All white drapery, such as collars, facos, shirts, &c., also the corners of the eyes, are painted on the back of the photograph with flake white; jewellery, lips, eyes, flowers, and similar things are also coloured on the picture itself, only care has to be taken to keep exactly to the outline. When this part of the colouring is done, take a second convex glass, put it over the photograph on the back and fasten the edges with adhesive paper; then mix the flesh colour, and on the back of the second glass paint all over the face; then paint over the hair, to make it the tint and shade desired; the same is to be done with the drapery and all other parts of the picture. It is more convenient to do this work on a negative retouching-frame, in order to preserve the outlines better. When painted, back with cardboard.

"Mr. Kraus, the introducer of these pictures, contends that the formula already published, based on his original invention, are defective, for the reason that castor oil causes the pictures to become more or less opaque, especially after a few months' keeping. Spermaceti, on the other hand, will make them endure indefinitely."

ON A NEGLECTED METHOD OF INTENSIFICATION.

BY CAPTAIN ARNEY, R.E., F.R.S.*

SOME three or four months ago I had the pleasure of a visit at Chatham from Mr. Warnerke, and in the course of some experiments with his tissue, he introduced to my notice a method of giving intensity to a negative which, as far as I know, has not been practised to any great extent in this country, but which to my mind is superior to any that I have as yet tried, including the ferro-cyanide of lead intensifier. The method of procedure is as follows:—To a saturated solution of copper sulphate is added a sufficiency of potassium bromide; and when I say sufficiency, I mean a quantity which is capable of converting nearly all the copper sulphate into potassium bromide. At ordinary temperatures an ounce of water will dissolve one hundred and twenty grains of copper sulphate.† It, will, therefore, be necessary to add about one hundred and twenty-five grains of potassium bromide (dissolved in a small quantity of water) to effect total decomposition. The exact quantity is immaterial, but the dose of bromide should not be spared. Personally I prefer to use at once a solution of copper bro-

mide, by decomposing barium bromide with copper sulphate, or by acting on copper oxide with hydro-bromic acid. In this case a solution of one hundred grains of the salt to each ounce is of sufficient strength. Having secured a solution of copper bromide in one of these ways, the developed and fixed plate is flooded with it, and allowed to act till the grey metallic silver becomes of a white appearance. When this is obtained, the plate is washed under the tap till the green colour of the solution no longer tinges the water, and until the addition of ammonia causes no distinct blue colour in the wash water. After arriving at this point, two methods of proceeding are open. The plate may be treated with alkaline pyro-gallate, when there will be an evident gain in intensity. So far as this the method of intensification is similar to that described in the *British Journal*, in which copper chloride is employed instead of the bromide. Instead of giving intensity by the alkaline pyro-gallate, another method is open. This consists in flooding the bleached plate with a strong solution (say of one hundred grains to the ounce) of silver nitrate. An intense black results; so deep is it, that in general it is more suitable for the intensification of line engraving negatives, than for half-tone negatives. With an emulsion giving a thin negative, however, it is invaluable.

When I saw the action of this intensifier, I was puzzled as to the reaction that took place; and finding it absolutely impossible to get a satisfactory analysis from the deposit on a plate, I precipitated silver, and treated it in the same manner, and analysed the compound at each stage of the proceeding. The results obtained are remarkable, and well worthy of attention. On addition of the copper bromide the following reaction was observed:—

1 equivalent of silver + 1 equivalent of copper bromide gives 1 equivalent of silver bromide + 1 equivalent of sub-bromide of copper.

Or—



On exposure to the light, the compound darkened readily, giving secondary evidence the silver was in this state. In one or two analyses I thought I had found that the one equivalent of bromine from the copper bromide had combined with two equivalents of metallic silver; but eventually I found that invariably when the reaction was complete, the whole of metallic silver was converted into bromide. When the above compound was treated with silver nitrate, we have a remarkable reaction. The sub-bromide of copper combines with the silver nitrate and forms silver sub-bromide, thus:—



The question as to whether sub-bromide of silver was really formed, or whether it was not merely bromide with 1 atom of deposited silver, was at first difficult to answer; but I think I have satisfactorily proved the presence of the sub-bromide. Had there been metallic silver present, it would have been possible to pass a spark from a Ruhmkorff coil through the compound, the small atoms of silver would have acted as steps by which it could pass. This was proved to be impossible, and, moreover, the current from a strong battery would not pass through the compound even when heavily compressed. I may state that in a mere mixture of bromide and metallic silver the spark passed.

When treated with ammonia, the compound split up into AgBr and metallic Ag. Nitric acid was also able to decompose the Ag₂Br, as was potassium cyanide. It need scarcely be said that no mixture of silver bromide and metallic silver would give the jet black appearance I have indicated, though a mixture of blue colour of the sub-bromide and the yellow of the bromide would do so. It was also noticeable that after treating the supposed Ag₂Br with ammonia, the metallic silver separated out in spangles much larger than the original particles of metallic silver. In the case of a simple mixture of the bromide and metallic silver, I do not think this phenomenon would be observed.

* Read before the Photographic Society of Great Britain.
† It must be remembered that copper sulphate is combined with five equivalents of water.

When the intensity is caused by the application of alkaline pyro-gallate we must look for a different reaction. Though you have the sub-bromide of copper present, it is soluble in ammonia, and can all be washed away, and probably is, if the washing be effectively done. In this case the intensity is gained by a re-arrangement of the atoms of silver, for there is only the same amount of silver present to be reduced as there was originally on the negative. In this case, then, we have a gain in intensity caused by a physical process more than by a chemical. Where long washing of the white compound is resorted to, I am not prepared to deny that part of the image may be formed of metallic copper. For another point to which I wish to call your attention is this:— CuBr is said to be insoluble in water, yet you may go on washing the bleached precipitate for days, and still you will find traces of copper bromide in the wash water. After some trouble I have found that the sub-bromide is rather unstable, tending to pass into the bromide and metallic copper, thus:—



Eventually, of course, the metallic copper is converted into oxide.

In preparing plates on which to secure photographs in the same method has been adopted, substituting the chloride for the bromide, and the following are the phenomena observed; the copper chloride bleaches the metallic silver on the plate, and gradually the bleaching gives place to a rusty tint, and this probably is due to the reaction indicated above. As this is part of the same method, already indicated, of obtaining intensity, it would follow that the image may be partly metallic copper, even before treatment with alkaline pyro-gallate.

To Mr. Warnerke belongs all credit for bringing this method of intensification to a knowledge of the society, for had he kept his treasure to himself, as is too often the case with some who get hold of "a good thing," I should not have had the satisfaction of referring to it to-night. Mr. Warnerke informs me that he found the treasure in the *Photographic News* amongst some American correspondence. I advise every one to give it a fair trial. At Chatham we infinitely prefer any process of intensification which gives the desired opacity without the necessity of converting the silver and other metal into sulphides. My experience has shown that all such are unstable to a greater or less degree.

DRAWBACKS.

BY E. DUNMORE.*

FINDING this evening we have no paper—in hunting phraseology we have drawn blank—I will try to supply the hiatus by a few memoranda that may, perhaps, give rise to some discussion. Of course, this paper is prepared under considerable drawbacks—the drawback of short time for consideration, the drawback of not having any books of reference, the drawback of having nobody else's writings to con over and appropriate under a new title; and, also, the drawback of serving it printed with all errors that may creep into such a rapidly-prepared paper. With all these drawbacks, I think I cannot do better than entitle this paper "Drawbacks." If I make any very glaring errors, I must ask you to look over them.

The first little matter that occurs to my mind is that of a plan for curing the reticulation of the collodion film when it is produced by solvents containing too much water, and which has gone the rounds of the photographic literature of the day. It is as follows:—"Place in the collodion to be cured a few strips of dry gelatine; this will absorb the water and the collodion will be rendered serviceable." Now, if this would absorb the water, no doubt the plan

would answer; but, as it will do no such thing, there is a considerable drawback to its general adoption. It was a simple matter, so I tried it. Several months passed by—no difference. At the end of twelve months, save and except the gelatine appeared rather more opalescent than before, no alteration had taken place. I added a fourth part of water to this collodion and gelatine, and let it stand some months longer, and the result was that the gelatine had not absorbed any—or, at least, sufficient—water to make any appreciable difference to the bulk; but it had become a pasty mass at the bottom of the bottle. What changes had taken place I am unable to say, and merely record the fact.

The permanency of silver prints has always been a matter of serious consideration with photographers, and any plan that would tend to give increased permanency was, and is, hailed with delight. Some nine or sixteen years ago Mr. Spiller recommended the addition of ammonia carbonate to the hypo. fixing bath. I felt very chary at expressing my opinion on the matter, having had comparatively small experience, although I had made a practice of adding it previous to Mr. Spiller's recommendation, but with a different intention. The idea was that hypo. in solution was apt to be acid and detrimental to the prints; so I used carbonate of soda, or ammonia, as the case might be, for the purpose of correcting this acidity. After hearing Mr. Spiller's paper, I invariably used the ammonia, and with great advantage as regards permanency. Some proofs then prepared have remained as bright and good as on the day they were prepared. During the past eighteen months I have used as much as two hundredweight of ammonia carbonate, and, as far as the matter of permanency, with, I have no doubt, good effects. But here comes the drawback: it was found that when the proofs so fixed were washed and dried, on careful examination (I say "careful examination," as the fault was very difficult to detect), a peculiar bloom was found to cover the whole face of the negative with marks and smears of a dull appearance here and there. Till these proofs were mounted the fault was not noticeable, but when they had been mounted these dull marks were very great eyesores, and necessitated each proof being rubbed over, the deposit, whatever it was, being removable by this means. Perhaps some gentleman present has had similar experience, and can suggest a remedy; for the present I am quite unable to suggest a cure, and this drawback is such that will prevent an otherwise useful modification of the fixing bath to be used where a large quantity of work has to be got through.

I have seen cyanide of potassium recommended in dilute solution for cleaning negatives that have got soiled with silver stains from hard work—small particles of the silvered albumen adhering to the cliché, and making white specks. There is no doubt whatever that the remedy will be, and is, efficacious; but here is a drawback, unless the varnish of the negative be very hard: the cyanide is apt to dissolve it sufficiently to attack the negative beneath, and utterly destroy it. Great care is, therefore, necessary to be taken in ascertaining the protective power of the varnish. Several applications of a rather strong solution are frequently sufficient to injure most negatives. This plan, however, used with extreme caution, is undoubtedly serviceable.

Of course there are many other drawbacks to processes that have been recommended for the benefit of photographers, but time is too short to permit allusion to them; therefore I will, with these few remarks, conclude, and leave them for discussion.

One little matter that scarcely comes under the head of "drawbacks" is the possibility of developing an ordinary wet plate by the alkaline method. In making a few experiments with the intention of causing a wet plate to keep moist and sensitive, I gave an ordinary sensitised film a coating of albumen and glycerine in the proportion of one

* Read before the South London Photographic Society.

ounce each to half-a-pint of water. Mr. William Bedford suggested development with the alkaline method, which I carried out, and found, although the negative seemed rather poorer than I should have liked, it came out very fairly satisfactory.

LANDSCAPE PHOTOGRAPHY.

BY JOHN PARKER.*

My earliest attempts at landscape photography (and it is only to that I have given any attention) were with a Newton's camera, eight by ten, and a long focus Ross' lens of three inches diameter. The sensitizing, developing, and clearing baths were all, as in Newton's, suspended below the camera, the whole thing being an immensely unwieldy affair, to carry which I had to utilise the tripod legs, on which it was suspended by straps, and carried by the aid of a friend, exactly in the fashion of a mason's hand-barrow, or a miniature sedan chair of bygone days. The method of working such a camera—apart from its cumbersome—proved unsatisfactory in the extreme. I next got a folding camera—portable by contrast with its predecessor, but still a bulky and troublesome affair, and, together with a tent, chemicals, &c., making such an amount of impedimenta as to rob an excursion of all its pleasure.

Several varieties of tent and sizes of camera were contrived, each improving some defect in its predecessor, and I succeeded in getting some fair work; but the cost and labour far exceeded the results, and were it not for an ardent love for the work, and an insatiable craving after the beauties of nature, I would have given it up in despair.

Dr. Taupenot's collodio-albumen formula for dry plates gave me the first relief. I tried it, succeeded—to my own satisfaction, at any rate—and discarded my tent and wet plates for years. Taupenot's process had one fault, however, in its great liability to blisters; and these sometimes sadly annoyed me, though I took every precaution, gave a preliminary coating of dilute albumen to the plate, and adopted every likely suggestion as a remedy for the evil. Fortunately, however, the blisters generally dried flat, so as not materially, if at all, to affect the printing qualities of the negative. But it was sometimes otherwise, and a negative which at first promised to be perfect would, when finished, prove useless.

Two or three years ago I was induced to try a modified collodio-albumen process, known as "Dr. Hyley's Hot-water Process," and on plates so prepared I have not known the annoyance of a single blister, though since I first tried it I have prepared many plates. Indeed, except a few experimental beer-and-albumen plates, I have confined myself entirely, for dry plates, to the "Hot-water Process" ever since; for my opportunities for photographic work are too rare to permit of wasting them in experiments in untried processes, however much recommended, and I attribute any success I have had to this sticking to one process. Where the object is to take good negatives, I would strongly recommend amateurs to do the same, unless they have plenty of leisure, and in that case there is, no doubt, great pleasure and benefit in experimenting.

But first loves are strong, and so I returned from time to time to my wet plates. A few years ago I contrived a very portable and convenient box tent, which gives but little reason for complaint on the score of weight or bulk. It is suitable for plates up to seven by nine inches, and, when folded up for carriage, contains a water-tight bath, ebonite developing tray with plate glass bottom, and a stock of chemicals sufficient for a long day's work; yet it may be carried in one hand for a long distance, and only measures, when closed, fifteen and a half by twelve and a half by six and a half inches, while two or three minutes

are sufficient to erect it and put it in working order on its own tripod. I have taken many of my best wet-plate negatives with this tent. I confess that I prefer wet plates to dry wherever I have convenience for working them; and, wherever the view I wish to photograph is reasonably near to my head-quarters for the time being, I employ wet plates. I have, however, always the dry to fall back upon when the distance is considerable or the time for preparation limited, or where the employment of the wet process would interfere with the pleasure or liberty of any friend with whom I may be out for the day. These are the occasions on which the advantages of the dry plates show themselves, and many good pictures may be obtained by means of them when the wet process would be quite inadmissible.

As to the camera, I would only say that no one should think of working without the advantages of either a swing back or a swing front; and the motion of the back or front, or of the two combined, should be such as to give the means of adjusting the focus not only for different distances in front—such as a very near bit of foreground, or a tall spire, &c.—but for different distances to the one side or the other, as the side of a street or avenue, &c. Many good subjects will, indeed, present themselves, for taking which satisfactorily these are not in the least necessary; but, on the other hand, without such appliances many inviting subjects either cannot be taken at all, or taken at a great disadvantage, rendering it necessary to have some portion of the subject on which much of its interest and beauty depends either left out altogether, or quite destroyed for want of true focus. I also always carry a small spirit level; indeed, I have one fixed on the camera by a screw at one end, on which it pivots. This is most useful, not only in taking buildings, but in working on a hill side, where the eye is often quite at fault as to horizontal lines.

Thus much for the negative; and in anything I have to say as to printing from it I shall limit myself entirely to a few remarks on skies and cloud effects.

The sky is half the picture—sometimes, indeed, the "better half;" for the charm of the original of which the photograph is the transcript is often mainly in the sky and in the aerial perspective which it gives. Take a moorland view, for instance, with a pool of mossy water, and a few rocks and ferns and stunted furze for a foreground, and a bright sky with fleecy clouds overhead, stretching away till it meets the distant hills that bound the view. What a charm there often is in such a scene! and how beautiful the miniature representation of it as we see it on the screen of the camera! But print from a negative taken from such a scene, and how disappointing is the result! Wanting the cloud effects it is a mere caricature of the landscape it professes to portray; whereas if a suitable sky be skilfully printed in, the beauty of the original is restored, and the pleasurable emotions which it produced are re-awakened as we look on the faithful reproduction. Such a scene as I have here supposed is, indeed, more dependent on the sky for its effect than one presenting greater variety of form, and subject, and boldness of outline. But every landscape that includes a skyline is dependent more or less on cloud effects for its beauty; and if the sky be left in the print a dead blank, the picture is robbed of its charm, and photography is unjustly held responsible for a defect which ought to be charged to the want of taste in the photographer. Perhaps, however, with the professional the price which the photograph will bring in the market has something to do with the matter. Yet it is much to be regretted that anything should induce an artist to set before him any but the highest standard of excellence to strive after; and I believe it is a false policy in the end, for the best work will command the best price, and give the satisfaction of an honest endeavour after the highest attainable results.

(To be continued.)

* Continuation of a paper read before the Glasgow Photographic Association.

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PERSONAL TUITION IN CARBON PRINTING.

IN the recent discussion in our pages on the possibility of "picking up" the carbon process without specific tuition, it was, we think, generally agreed that lessons of some kind, oral or written, were imperatively necessary, and that where it was available, personal tuition was an advantage not to be rejected. The fact that in photography there have been hitherto but few apprenticeships, few professors and pupils—that, in fact, the majority of those practising the art, either for pleasure or profit, have "picked it up," aided by manuals, journals, and societies, with the occasional personal aid of some friendly practitioner—has naturally engendered in the minds of photographers generally a notion that all things pertaining to photography should be subject to like conditions. New processes or new methods and improvements have been introduced from time to time, and have been adopted without trouble. Something less than twenty years ago the alkaline gold toning solution was introduced to supersede the old hypo toning bath. The conditions were in many respects novel, but photographers mastered them by the aid the journals afforded. So with the abandonment of pyro, and the substitution of iron salts, for development. So with various dry processes. Hence it is not unnatural, when a new system of printing is introduced into photography, that those photographers disposed to try it should expect, after a little effort, to master it without tuition, picking it up as they had other novelties. But carbon printing is a change of such a radical kind, and for its successful commercial practice requiring such a revolution in the system of working that experience in silver printing, instead of being an aid, has, in many instances, been found an impediment to facility and success. Men of patience and skill have "picked up" the process, of course, without tuition, but as success depends much upon experience in methods of working, much time and patience are wasted in any unaided attempt so to "pick up" a mastery of the new method.

There cannot be a doubt that tuition by a capable practitioner very materially shortens the road to success; but it has so happened that just at the period when professional photographers are beginning to be keenly alive to the importance of carbon as removing the stigma of instability under which their art rests, the barrier, in the shape of a thirty-pound licence fee, stares them more prominently in the face, with the still more prohibitory, although not unnatural, condition that instructions will be given to licensees only. Many photographers aiming at straightforward fair dealing, recognizing in the thirty-pound charge for a licence only a legitimate remuneration for time and skill expended in working a process out, and placing it in a practical and working form before photo-

graphers, do not object to pay the fee itself, but for one serious misgiving. They are doubtful as to whether they shall be successful in working the process, about which an air of secrecy and exclusiveness has very unnecessarily been thrown of late. The payment of the licence fee being of course a preliminary to the receipt of lessons and the acquisition of knowledge, no certainty could be gained in advance. Our pages, it is true, have teemed of late with communications from gentlemen of skill who have been successful, and who, being licensees, are familiar with all the arcanæ supposed to be so carefully guarded; but still doubts have prevailed.

Tuition and practical demonstration easy of access, moderate in cost, and from a trustworthy teacher, were manifestly the wants of the day, in relation to carbon printing. And these wants may now readily be satisfied. The thoroughly trustworthy teacher is the first requisite. About his ability and experience there should be no doubt or question; and his ability should be avouched by his work. We believe that we hazard nothing in remarking that Mr. Higginson, of Southport, is the most successful carbon worker of the day. His praise is in all the studios where carbon is known. His work, of which we have seen much, is superb in its excellence; it is, indeed, literally faultless. Thus much we can speak from personal knowledge. Of the varied improvements he has introduced in the practice of carbon printing, of his personal skill, and the rapidity of his system, we have heard much from various visitors to his establishment. One enthusiastic Lambertyper, whom Mr. Higginson had redeemed from the Slough of Despond, declares that Mr. Higginson is as much in advance of Mons. Lambert, as the latter was in advance of all other carbon workers. Another visitor assures us that the statement was literally true that Mr. Higginson could produce a larger number of perfect double-printed chromotypes in the same time, than a skilled silver printer could produce ordinary albumenized prints. Many of our readers have doubtless seen the challenge to the best silver printer, issued some time ago by Mr. Higginson, and are familiar with his announcements that he is prepared to give lessons and demonstrations, in which he will show that carbon printing for ordinary small work in portrait studios is easier and more certain than silver printing. This announcement was deprived of the greater part of its general interest, however, by the limitation that these lessons and demonstrations were for licensees only. Instead of being able to acquire the assurance which such demonstrations would bring, as an inducement and encouragement to pay the requisite sum for a licence to practise, it was only attainable after the thirty pounds had been disbursed. We are happy to be able to announce, however, that this limitation will no longer exist. Mr. Higginson has resolved that his lessons and demonstrations shall be accessible to photographers generally, whether Lambertype licensees or not. The non-licensees, the Autotype licensees, and the Lambertype licensees, will in his lessons be placed on the same footing. For a moderate honorarium all will be taught every detail of every process. It rests, then, with the pupil as to what course he will take. Having acquired practical knowledge of the processes, and skill in working them, he can make his election as to which licence he will obtain. He may rest assured, apparently, that unless he is prepared to become defendant in a Chancery suit, some licence will be required. And if he be a reasonable man he will probably come to the conclusion that the high state of practical perfection to which the process has been brought is mainly due to the existence of a patent which has given some one a sufficient interest in cultivating the process, and overcoming those difficulties which few, without a special and pecuniary interest, would have had the time or patience to work out and overcome. The process, as the photographer may now acquire it, as compared with its crude idea in an unprotected and un-

cultivated state, is as a fair garden compared with a piece of common land or moor. And the money value or rental of the two would probably bear the same relation.

THE DISCUSSION ON THE NEGATIVE BATH.

In a letter on another page, Mr. Thomas calls attention to a somewhat important omission in the recent discussions at the Photographic Society in relation to defects of the silver bath. With the exception of Mr. York, no one taking part in the discussion brought examples of the defects which were spoken of in general terms as "spots" and "pinholes," as though these defects were always specific in character; whilst in point of fact, although similar, they vary, and it is probable that on careful examination each special cause will be followed by a distinct character of defect. We have an illustration of this in the illustrative negatives brought by Mr. York to the last meeting. Mr. York found, oddly enough, that a sulphate added directly to the bath did not produce the pinholes which were supposed to result from the presence of sulphate of silver. The negatives in question are now before us, and are quite free from pinholes; but they are characterized by another defect, to which Mr. York in his remarks referred as removal by the addition of nitrate of baryta. This defect consists in streaks and zigzag lines, or markings like a "watered" silk. And such streaks and markings were amongst the defects which Dr. Vogel found as, together with pinholes, amongst the results of sulphate of silver when he first proposed the use of nitrate of baryta as a remedy.

If all the forms of pinholes and other defects were produced direct by artificial means, and a careful examination made of their appearance and character, it is probable, we think, that they would be found sufficiently special to afford a future guide as to their source and origin.

MILITARY PHOTOGRAPHY.

From the *Army Estimates* we learn that a larger expenditure than usual will be made this year upon matters photographic. The field photographic equipment which will form part of any future army has now been completely organized by Captain Abney, R.E., F.R.S., who has had charge of the same, as also of the instruction of the officers and non-commissioned officers entrusted with photographic duties, during the past five years, at Chatham. Captain Abney, after having established both chemical and photographic schools of instruction at Chatham, now leaves that station, his term of staff service having expired, and proceeds to South Kensington, where he has been appointed Inspector of Science Schools.

Captain Abney is succeeded at Chatham by Lieut. Darwin, R.E., son of the well-known Dr. Darwin, and himself a gentleman who has already made his mark in science. Lieut. Darwin was entrusted with the care of the photographic operations at one of the Transit of Venus stations two years ago, and acquitted himself of the responsible duty in a most satisfactory manner. So far as photography is concerned, he is, we believe, one of Captain Abney's pupils, and consequently well fitted to carry on the work on which the latter has been for some time occupied.

The field photographic equipment, as organized at Chatham, is now a very complete affair. A waggon fitted with every convenience, and carrying the necessary apparatus and chemicals, forms the head-quarters of the photographic staff, who are, however, provided with the means of working when this comfortable conveyance cannot be resorted to. The last, and by no means the least, important addition that has been made to the equipment is, we are glad to hear, Warnerke's negative tissue, and that gentleman's ingenious dark slide, which will be invaluable for reconnaissance work. A better testimony, we think, of the practical value of this material could hardly be afforded, and we heartily congratulate the hard-working experimentalist on his deserved success.

AN EMULSION PROCESS.

BY CAPT. ABNEY, F.R.S.

It may not be uninteresting to some of your readers that I should give an account of a method of making a rapid emulsion, and which also possesses unusual delicacy. I was led to it in prosecuting researches on the photography of the ultra-red end of the spectrum, and have found it sensitive to these rays, though owing to the present want of sunshine I have been unable to arrive at any definite idea of its value compared with other emulsions containing organic salts that I have previously used. My friend Mr. H. Berkeley has worked with it, and reports favourably of it; and Mr. Warnerke, to whom I gave the formula, I believe has found it efficient.

The following is the mode of preparation:—Sixteen grains of ordinary cotton (*not high temperature cotton*) are dissolved in six drachms of ether and four drachms of alcohol, both being as far as possible free from water. In each ounce of collodion twenty grains of zinc bromide are dissolved, and fourteen drops of strong nitric acid also added. For each ounce of the above, one grain of dried albumen is taken and dissolved in a little water, to which a little ammonia has been added to aid solution. The collodion is poured into a glass jar, and the albumen added little by little—stirring the whole time. This forms a sort of emulsion of albumen in the collodion.

Mr. Berkeley proceeds in a somewhat different manner. He adds the cotton to the ether, then adds the albumen, and finally adds the amount of zinc bromide in the necessary alcohol. This is a very effective method of proceeding, but the former answers as well.

Enough silver nitrate is then dissolved in the smallest quantity of water, and alcohol added to it, and the emulsion formed in the usual manner. The amount of silver nitrate to be added is fixed by the fact that there *should not be less than two grains in excess of that necessary to convert the whole of the soluble bromide into silver bromide, and the albumen into silver albuminate*. This can only be arrived at by calculation checked by a trial of the amount necessary for the conversion of the albumen—practically, about thirty-six grains will be found sufficient for the above amount of bromide and albumen.

The emulsion is next poured into a dish and allowed to set firmly. This I encourage by moving the liquid in the dish by means of a stirring rod. When the mass is capable of being broken up into small coherent lumps of the consistency of thick jelly, the washing commences. This I effect first in the dish by covering the pellicle with distilled water, and allowing it to soak for about five or six minutes. It is then transferred to a glass beaker, and washed with constant changes of water for about two hours. At the expiration of that time the washings should only give a very slight milkiness when tested for silver with hydrochloric acid. I consider the washing complete when the wash water to which the acid has been added appears of a turbidity equal to that shown by dissolving one-sixth of a grain of sodium chloride in four ounces of water, and then adding silver in water to it. When in this state the pellicle is dried in a water oven, taking care previously to get rid of all excess of water by squeezing it between folds of pure blotting-paper. This operation takes about three-quarters of an hour, and to test when the pellicle is sufficiently desiccated it is as well now and then to take a small piece of the emulsion from the oven, press it on blotting-paper; when no stain of moisture is shown, I consider it sufficiently dried. I may remark, that in my experience excessive desiccation of any pellicle seems to destroy the qualities of the resulting emulsion.

The pellicle is next dissolved in equal parts of ether and alcohol, allowing eight grains of cotton for each ounce of the combined solvents. This may not be sufficient, but I consider it better to add too little than too much of them at first. The alcohol may be of strength equal to .812, and the ether of .720; both of them may be methylated, the

for great sensitiveness I rather incline to the pure solvents. On coating a plate with this emulsion, and after drying, if the film be examined against a gas-flame, the colour will be seen to be very remarkable. The flame will appear of a greenish-blue tint, not in the least white, but rather of the colour that would be observed were the glass coated with a fine film of silver. The difference between this emulsion and the ordinary kind is very marked; with a film of the latter the flame appears of a red orange.

The exposure necessary to give the plates is very small, even when compared with a wet plate. I believe them to be twice as rapid as plates prepared by the ordinary wet process, when exposed under the same conditions. The blue colour of the film indicates the cause of this—the particles of the sensitive salts are in a much finer state of division than is usually to be met with. A microscope reveals this fact most unmistakably.

There are several ways of developing these plates. The ordinary strong alkaline developer, with a double dose of bromide, is most effective, whilst pyrogallio acid alone will give a feeble image, capable of being given intensity by the ordinary method. A gelatino-iron developer is also effective, as is also pyrogallio acid with acidified silver nitrate.

I should be glad to hear of any of your correspondents who may try this process giving me the results of their observations. I have found it a cleaner and smoother emulsion than any I have made, and certainly much more rapid. The fault, if it have any, is, that it is apt to give negatives slightly wanting in density; but this can be corrected by using the intensifier I brought before the Photographic Society last meeting, or by substituting hydrochloric acid for a quarter of the nitric acid used in preparing the emulsion.

ON PLATINOTYPE.

BY THOMAS RODGER.*

GENTLEMEN,—I have the honour this evening of drawing the attention of this Society to a very beautiful process of printing from photographic negatives, termed platinotype. The author of this process, Mr. Willis, was present at your last meeting, and it would have been highly satisfactory that circumstances had favoured his bringing this subject before you himself. As it is, I will endeavour to describe briefly the chemical principles on which this process is based, and then give you a practical demonstration of the *modus operandi*, as far as is possible.

This process, I need scarcely tell you, has been repeatedly and very lucidly described in our photographic journals, as well as in other periodicals, and particularly so by Mr. J. Traill Taylor in the *Science Review*. But it seems to me that it has not received that amount of attention which it deserves from the great body of photographers. The great simplicity of the few operations requisite, and the absence of that capricious character which attends several other processes, apart from the undoubted and absolute permanency of the result obtained, ought to gain the attention of a large majority of the brethren in our art.

Without presuming to make a comparison between results obtained by other methods and those of this process, I may be allowed to say a few words. In the ordinary application of this process to the printing from negatives of all sizes, and in which it is not intended to subject the prints obtained to painting or other art finishing, I am aware that it has generally been asserted by the profession, and this with some reason, that the colour of the prints which they had seen was too cold to satisfy the general taste. Now, from the small amount of experience which I have had in this process, and from what I have seen produced by others with more, I feel confident in saying that there is little fear of getting a

wide range in tone quite sufficient to satisfy in this respect.

In our much-loved process with silver in its several conditions forming the picture, we have found it too facile in every respect—so much so, that I fear that at the very best, pictures formed of silver in metallic form, or in other combinations, cannot fail to be very prone, both to internal as well as to external influence. In the case of pictures formed of platinum, if we succeed in obtaining the beauty of the silver picture (and this I think quite possible), we have a basis for our productions quite beyond those influences in the highest degree. Again, there is a very important branch of the art which, for years past, has been of much consequence to the professional photographer. I allude to the artistic finishing in oil and water colour, &c. Now, I hardly think I need remark that the application of pigment in any form has been found, from various causes, to do other than hasten the destruction of the photographic image which formed the guide of operation. Now, in a picture formed of platinum, we have a deposit of the pure metal in the form of what is generally termed platinum black, forming the image in direct contact with a surface, and without being enclosed in any film, and, consequently, fit to be loaded to any amount with colour without danger of peeling off or chemical change. This has always seemed to be a desideratum connected with the class of work referred to, and this process offers every facility to fill the void.

I shall now endeavour to give you a short description of the rationale of this process. Mr. Willis, in a series of experiments to find the best reducing agent of platinum, and without any special photographic aim, found that oxalate of iron—a yellow, and in most menstus an insoluble powder—was soluble in a warm solution of oxalate of potash, and that it in this condition acted most energetically as a reducing agent on soluble salts of platinum. Mr. J. Traill Taylor in his article referred to, gives such a clear and short description of the chemical changes involved in this process that I cannot do better than quote a few of his remarks with the least possible modifications.

Mr. Willis, therefore, having discovered that as a solution of ferrous oxalate in potassic oxalate was so perfect a reducing agent of platinum, conceived the idea that as ferrous oxalate can be produced by the action of light on ferric oxalate, it ought to follow that paper or other media which has received a wash of platinum will undergo reduction in proportion to the action of the light. In the practical application of this process, pictures of fine quality are obtained in about one-fifth the time of exposure requisite in ordinary silver printing. When the pictures are taken from the printing frame they are feebly, though distinctly, visible, although up to this stage the platinum has not taken any part in the performance. The visible picture is wholly composed of ferrous oxalate, and it would have been equally visible had no platinum been present. The picture is now drawn over a warm solution of oxalate of potash, and instantly the image formed of metallic platinum becomes strong and rich, and of a warm black tone. As far as mere permanence is concerned, the picture may now be considered finished. The developing action of the oxalate of potash will be readily understood from the following considerations:—Bearing in mind the axiom that no chemical action can take place unless one of the substances be in solution, observe that when the picture is removed from the printing frame the two substances are solid; so to speak, apart, ferrous oxalate and the platinum salt, and hence the former body has not had an opportunity of acting upon the latter, both are side by side, and in the most favourable condition for one to act upon the other, but it is held in check. The question now arises, what will relieve it so that it may reduce the platinum so conveniently placed for this purpose? This ferrous oxalate produced by the action of light is not soluble in water, but it is so in a solution of oxalate of

* Read before the Edinburgh Photographic Society.

potash. No sooner, therefore, is the picture brought into contact with a solution of this salt, than the exposed parts consisting of ferrous oxalate are dissolved, and immediately exert their reducing action on the neighbouring particles of platinum, which thus are made to form the picture. It must be remembered, however, that the paper or surface was charged with ferric oxalate in order to secure sensitiveness to light, and that it is desirable that this should be removed. To effect this, it is only requisite to subject the print for a few minutes to a weak solution of oxalic acid. This renders the whites very pure.

(To be continued.)

Correspondence.

AN OLD BATH WHICH DID NOT GET OUT OF ORDER.

DEAR SIR,—I notice some interest is excited in the diseases of the negative bath just now. I believe the bath troubles are mostly traceable to the person of the operator. If Mr. Spiller or anyone else would care to examine the enclosed, he may perchance find out something, though possibly it will be more of a negative nature than anything directly informative.

The mess enclosed is the filtrated deposit found in a negative bath, originally measuring about three gallons. It had never been strengthened; it had never been filtered; it was in daily use; never had any rest; never sunned; never covered up to keep in the ether and alcohol, or to keep out the dust, except once a week, when the dark room was cleaned after thousands of half-plates and other larger negatives had been made in it—the bath got so low that it would not cover the breadth of a half plate, yet the last negative was *perfect*, no pinholes, no stains or streaks, no intensification necessary, yet fully soft. I suppose in ordinary practice it would be expected that the bath should have *broken down*, but this it never did. I have at this moment a bath similarly used, and in as positively a filthy state—which anyone may see—yet though my negatives should be full of pinholes and stains, I find them quite free from such defects.

But if I filtered it, and so upset it, my experience would lead me to expect *hard negatives* at once, and it would soon break down altogether. I will not bother you with my theory, but if anyone cares to examine the enclosed I would very much like to know his opinion as to its nature.—Faithfully yours,

PORTOBELLO.

[As Mr. Spiller was engaged in examination of similar deposits when we received the above letter, we placed the filtrate above alluded to in his hands, and he was good enough to furnish the following report.—ED.] :—

MY DEAR SIR,—I found an opportunity to-day of testing the silver deposit from negative bath which you sent me a few days since. It consists principally of *carbonate* of silver, with small quantities of sulphate, bromide, iodide, and reduced metallic silver. It is quite devoid of detonating properties, and contains no cyanide.

Your re-publication of Dr. Vogel's old communication is very interesting, and shows how fully he had gone over the same ground. With kind regards, I remain yours very truly,

JOHN SPILLER.

2, St. Mary's Road, Canonbury, N., March 28th.

NORTHERN PHOTOGRAPHIC NOTES.

SIR.—The Edinburgh Society's meeting of last Wednesday was a very enjoyable one. Mr. Rodger, of St. Andrew's, treated the Society to demonstrations by Willis's platinum process. I am afraid the Albion Albumenizing Company will not be able to do much with it, even although Mr. Rodger, and others of influence, should praise it. It is not a perfect process; it is not certainly a permanent process; and, owing to the cold colour of the prints, its use is limited to a very great extent. Francis Miles, and a

series of comic sketches published by Poulton, are printed by this process, but these have the doubtful element—*via*, hypo.—and if hypo. remains to any extent in the print, it is open to as much distrust as silver.

Herr Kareline, of Nijni-Novgorod, hopes to make a fortune by teaching us how to produce groups and genre pictures by means of some marvellous contrivance producing depth of focus to a great extent, and—mark this—without the aperture being diminished. The pictures which appeared at the Edinburgh Photographic Exhibition are referred to in a letter from Herr Kareline read at the Society's meeting last week. He says :—"These are my ordinary productions, and not exceptional pictures; they are not produced by any known method; they are not double printed, not touched up on negative or print—indeed, it is a secret of my own." We may expect to receive, in a few days, a proposal to divulge, in a multiplicity of paragraphs, and for a handful of roubles—after the style of C. Klary—the wonderful system which has "seduced and enraptured" the great and small, rich and poor, photographers of Edinburgh.

Mr. Paton, of Greenock, was at the meeting, with his clever pictures after Kareline. He thinks the secret is now no secret, and explained his mode of procedure; but Paton the prophet was not in a far country. What a scandal it would be if a Greenock-body were to teach the wise men of the East some new thing!

Edinburgh photographic business is in a poor way just now. Here is an ominous sign: a well-known photographer advertises to take a negative and supply a print for one shilling! I would as soon go off, in a suit of solemn black, to deliver moral pocket handkerchiefs amongst the Red Indians, or stay at home to sell wooden nutmegs to the dispeptic mothers of Midlothian; it would be ill to tell which of all would be the most disreputable. A Glasgow photographer, long ago, took a carte and supplied a proof for a shilling. He made a reputation, and money also—pound notes. He made a journey across the Atlantic with his pockets full of *home made* pound notes, and a lady—not his wife—hanging on his arm. The authorities brought him back, and had him tried and found guilty of taking a negative and producing a print for one shilling—at least, this was the verdict of a photographic jury, although tendering forged notes was the most serious count, for which he got penal servitude. Mr. John Nicol, Doctor of Philosophy, once tried to write up "penny photographs"; I would like to say something on them also, but at present I cannot afford to be sarcastic on anything lower than taking a negative and supplying a print for a shilling.

Mr. Samuel Fry well knows that as long as carbon printing was in embryo it was free to everybody, and sluggishness, not progress, was the watchword. Those who have spent from twenty to thirty thousand pounds are more likely to have aided than hindered the progress of the art. Those who have added their quota of money as well as brains have in a couple of years made chromotypy a commercial success.

To say that "the Autotype Company have been hindering and hurting the progress of the art" is a gross libel. To say that "the Company's present action will prevent experimental trial, and that it will cut off carbon work from a large number of photographers," goes for nothing, in the face of "only thirty issuing their work in this way." Messrs. Urie, Fry, and Company, who talk about the patents limiting and hurting the progress of the art of pigment printing, argue on false premises, and the sooner they see it the better for themselves.

Let us end this dispute about the patent rights by recognizing them, for they are not grievous burdens, but all the other way. Mr. C. J. Witcomb's example should teach us all to be more liberal-minded. I intend telling a thing or two myself next time I write to you.—Yours truly,

JO. VANNIA.

M. BOISSONNAS' SPECIMENS.

DEAR SIR,—It may interest some of your readers who were not present at the meeting of the Photographic Society on Tuesday last, to know that the albums of instantaneous and other photographs exhibited by Mons. Boissonnas, of Geneva, are in my possession, and that I shall be very happy to show them to any one who feels interested in them, and who will favour me with a call.—Very truly yours,

JAMES A. SKEWES.

9, Grafton Road, West Kensington (Addison Road Station).

DISCUSSIONS AT THE PHOTOGRAPHIC SOCIETY.

SIR,—Will you permit me to suggest that, by way of illustrating the subject under discussion at the meetings of the Photographic Society, some of our friends would perform an act of kindness, and at the same time help to elucidate the matter, if they would exhibit some specimen negatives showing the character of the defects now brought before the notice of the Society? There could then be no misunderstanding regarding these plague spots. There are pinholes and pinholes, spots and spots, comets and comets; it would be well to have these diseases properly classified for the purpose of easy recognition; or, in speaking of pinholes, one person may mean one thing, and another something quite different.—I am, yours, &c., R. W. THOMAS.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on the 5th inst., the chair being occupied at first by V. E. FOXLEY, and afterwards by the Rev. F. F. SATHAM, M.A., President.

It was intimated that in consideration of no paper having been previously prepared for the meeting, Mr. Edward Danmore had kindly written a short one on "Drawbacks," since he had arrived at the meeting. This was accordingly read (see page 172).

A conversational discussion ensued, during which

Mr. WARNERKE said that although reticulation of collodion was generally attributed to water, it was owing, in most cases, to the nature of the pyroxyline.

Mr. W. M. AVES found that the best means of cleaning negatives which had become discoloured in printing was to rub them with turpentine on a pad of wool.

Mr. FOXLEY, with reference to a remark that had been made concerning carbonate of ammonia in the printing bath, observed that Mr. Spiller had recommended it as a solvent for the albuminate of silver that was formed.

After a desultory conversation, the thanks of the meeting were voted to Mr. Danmore.

Mr. WARNERKE exhibited a number of negatives and specimens showing the action of bromide of copper as an intensifying agent, and showed the method of applying it. He further exhibited a plate box for holding wet negatives, and the triangle of a camera-stand which had been constructed by Mr. Lane. After a vote of thanks to Mr. Warnerke the proceedings terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The sixth ordinary meeting of the session was held in 5, St. Andrew Square, on the evening of Wednesday, the 4th inst.

The chair was occupied by the President, Mr. Lussell, and the number of members present was unusually large.

The minutes of the previous meeting were read and approved, and the following gentlemen were admitted ordinary members:—Messrs. Charles Philip, John Macmahon, Daniel Macfarlane, James Muir, James Dickson, and James Hay.

Mr. RODGER, of St. Andrew's, read an interesting paper on the "Platotype Process" (see page 176), and illustrated it by a number of successful experiments, which conveyed a clear idea of various reactions involved. Especially interesting were the experiments by which the simplicity of the process, the rapidity with which the paper was prepared, and the great sensitiveness of the preparation were shown. Some idea of the latter may be gathered from the fact that two prints were obtained from negatives by an exposure of under two minutes to the light, given out by the combustion of a double strand of magnesium wire.

The President said that the Society was much indebted to Mr. Rodger for the clear description he had given of the interesting process, and especially for the highly instructive experiments which must have entailed so much trouble to him. From the lucid way in which the subject had been treated, there could be no question either of the success or value of the process.

Mr. TURNER congratulated Mr. Rodger on the successful demonstration of what he considered the best process yet devised for many purposes, and especially for coloured work, the texture being just the very thing required in that branch of art. He had experimented a good deal with the process when it was first introduced, and he had no doubt that prints in platinum black were quite as permanent as those in carbon. They were not affected by either nitric, sulphuric, or hydrochloric acids used singly, although of course they yielded readily to the nitro-hydrochloric; and he found also that a strong solution of hyposulphite of soda materially changed the colour of the deposit, and therefore supposed that something like a platinum hyposulphite might be formed.

Mr. BASHFORD had not previously given the process much consideration, and therefore until to-night knew very little about it. He thanked Mr. Rodger very much for the beautiful demonstration and lucid explanation, and was quite satisfied that from them he had learned enough to enable him to succeed on a first trial. The only difficulty that occurred to him was that of ascertaining exactly the proper exposure, as from the fact that the development was almost instantaneous, and the difficulty of in any way reducing a too dark image, he presumed that there could be but little latitude in the time of exposure.

Mr. TURNBULL was very much pleased with the paper and experiments, and was quite sure that from what he had just seen he could at once do good work in platino-types. It was so simple and so satisfactory that, in all probability, carbon printing would soon be a thing of the past.

In reply to a question from Mr. Norman Macbeth, Mr. RODGER said that from his experience of the process he had no doubt that the actual cost of prints in platino-type was considerably less than that of prints in silver; and in answer to Mr. Bashford, he said that it was quite true that a platinum print could not be easily toned down or darkened, and, in consequence, the exposure must be properly timed; but neither he nor his assistant found any difficulty in hitting the proper time when the actinometer was used.

A number of fine specimens were then handed round for inspection—some by Mr. Rodger himself, some by the Albion Albumenising Company, and some by Mr. Griggs, of Blackpool. All were very beautiful, the latter especially so, as they were not only most charming subjects, but, by a method of his own, just sufficiently glazed to give the generally admired transparency not often seen in prints on plain paper.

There were also shown some prints on rough crayon paper by Mr. Willis, the inventor of the process, from paintings or water colour drawings, regarding which Mr. NORMAN MACBETH said that he had never seen anything finer. They came nearer to the pure white and black of an engraving than copies by any other process, and would, he thought, compete very closely with the productions of Messrs. Goupil and Co., now so popular.

Mr. HUNTER, of Hawick, also exhibited a number of very good carte portraits printed in platino-type, and said that he had only given the process one trial, and those were the results. It was certainly the simplest process he had had anything to do with.

The Corresponding Secretary then read a letter from Mr. Kareline, of Nijni-Novgorod, which mainly referred to the criticisms that had been published on his works, especially the picture to which was awarded the gold medal at the late Exhibition. Mr. Kareline wrote to the effect that all his pictures sent to the Exhibition were printed from single negatives taken direct, and were untouched prints from untouched negatives; that with trifling exceptions they were the portraits and groups taken in the ordinary course of business, with no more time devoted to them than is generally given when other sitters are waiting. Mr. Kareline has evidently solved the problem of how, by a small stop or otherwise, in combination with a short exposure, to get objects that are in various planes in equally good focus, and for this secret he has been offered considerably over fifteen hundred pounds; but he wants nearly five thousand, that he may be able to devote himself more thoroughly to photography as an art.

Mr. PARON, of Greenock, who, along with the Secretary of the Glasgow Photographic Association, had come through to attend the meeting, laid on the table a number of cabinet pictures in

imitation of Kareline's style, and briefly explained the method of lighting employed. The principal light was admitted through an ordinary window in the wall of the studio, and the shadows softened by a secondary light coming from a considerable distance in front. Under ordinary circumstances the detail in the white curtains would be lost from the large amount of light coming through the window, but this was obviated by lining them with an opaque substance, the front light only being allowed to act on them.

Mr. TUNNY, while admiring the pictures shown by Mr. Paton, and admitting that they bore a close resemblance to those of Mr. Kareline, still held to his original opinion that the window was not the source of light, that it was in fact a property window, and that the principal light came from above it, and the secondary from a long way in front, or from reflectors.

Dr. THOMSON said they were greatly obliged to Mr. Paton for giving them an opportunity of seeing his pictures, and for the description of the condition under which they were taken, as they had gone far to illustrate the method adopted by Mr. Kareline. He hoped others would soon follow in the way led by Mr. Paton, and that we should soon have many able to produce work equal to that of the successful Russian.

A number of fine carbon enlargements by Messrs. T. Annan and Co., of Glasgow, in both single and double transfer, were then brought to the notice of the members, and elicited much admiration, "The Broken Toe," by Mr. Diston, of Leven, in various sizes, being exceptionally good—much better, in fact, than a print from the original negative.

The SECRETARY next read a communication from the Glasgow Photographic Association with reference to a possible application for an extension of the patent granted to Mr. Swan, which expires next year, and requesting the co-operation of the Society in opposing such an application.

Mr. ROBERTSON (the Secretary) briefly explained the reasons that had induced him to send out the circulars, and

Dr. JOHN NICOL said that while anxious to fraternize to the fullest extent with their Glasgow friends, he had a doubt as to the propriety of entertaining the question now brought before them. One of the fundamental principles of the Society had been the determination to steer clear of the commercial element, and he thought any action in regard to patents would be an unwise departure from that principle.

It was ultimately agreed, on the motion of Mr. Pringle, seconded by Mr. Dobbie, to remit the matter to the council to bring up a report on the subject.

In accordance with a provision in the circular, a number of pictures from foreign exhibitors, that had been mounted and framed by the committee, were disposed of to the highest bidder, and brought fairly good prices, upwards of fourteen pounds being realised.

Votes of thanks were then given to Messrs. Rodger, Robertson, and Paton, and the meeting was adjourned, several items on the billet being postponed in consequence of the lateness of the hour.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Society was held at the usual place of meeting, the Museum, Queen's Road, Bristol, on Wednesday, the 4th inst., Dr. THOMPSON in the chair.

The minutes of the previous meeting having been read by the Secretary, and confirmed,

The SECRETARY read a communication received from the Glasgow Photographic Association, asking for the co-operation of the Bristol and West of England Association in trying to prevent the renewal of the Swan carbon patent.

A general discussion ensued, when the following reply to the Glasgow Society was decided on:—

"Under the existing patent good and reliable tissue is manufactured. The non-renewal of this patent would chiefly affect professional photographers, and would not increase the scope for fresh discoveries proportionately with the sacrifice that would necessarily accrue to the present holders of the patent; for, without any discourtesy, it is generally admitted as incontrovertible that few, if any, discoveries of importance have emanated from the professional community—no doubt attributable to the want of time for research, and other causes. Also, looking at the probable manufacture of inferior tissues, this Association is of opinion that the renewal of the present patent (all requisite conditions being fulfilled) should not be opposed."

Mr. T. DAVY, of Bristol, was then elected an ordinary member of the Association. The Easter holidays having very

much interfered with the attendance of members, the meeting was adjourned at an early hour, Dr. Thompson's paper being postponed till the next meeting.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE usual fortnightly meeting of this Association was held on the 28th ult., in the rooms of the Religious Institution, Buchanan Street, Mr. URIN occupying the chair.

The minutes of the previous meeting having been read and adopted, and the correspondence read,

Mr. JOHN PARKER read his paper on "Landscape Photography" (see page 173), and exhibited a large number of specimens of his work, described his tent (which he had brought with him), and his *modus operandi* generally.

The paper was listened to with great attention, and the members were unanimous in considering his pictures beautiful specimens of the art, and his field tent an exceedingly simple, portable, and efficient one.

Mr. GILFILLAN suggested that Mr. Parker should lead one of his negatives to the Association, so that prints might be got therefrom.

Mr. MACPHERSON considered Mr. Gilfillan's suggestion a good one, and suggested that the negative be given to Mr. Stuart to print copies from.

Mr. TANNHILL thought that in the proper printing and toning lay a good deal of the beauty of Mr. Parker's specimens, and considered that many portrait photographers would be quite unable to produce such beautiful results from his negatives as he could himself; he would, therefore, suggest that the printing be left to Mr. Parker. That gentleman, he thought, had given a good lesson to many professional landscape photographers as regarded the production of views with cloud effects. Many of the latter gentlemen's work, as Mr. Parker had pointed out, were almost spoiled for lack of cloud effects.

The CHAIRMAN thought it too much to ask Mr. Parker to give both negatives and prints, and considered it would be better to pay one of their professional brethren who did something in landscape photography. The paper he considered the best that had yet been read before the Association. Of the specimens he could not speak too highly, their aerial perspective surpassing anything he had hitherto seen, while they were also extremely clear and sharp all over. The cloud effects were admirable and well-chosen; in that alone Mr. Parker had shown his artistic talent.

Mr. DODDS asked how the pictures in the frames were mounted—were they attached to the glass?

Mr. PARKER explained that some of them were attached by a thin, transparent gelatine. They were the first he had tried that way, and a bell here and there was to be seen; but he was now able to obtain them perfectly free from that defect. The mounting of the prints in the manner described was a good idea, he thought, giving them greater brilliancy than could be got otherwise.

The committee on carbon patents submitted a circular which they had got printed and circulated. This was read, and members expressed their approval of this part of the committee's work.

Mr. JOHNSTON made a few remarks regarding his bromide emulsion process, and exhibited a few negatives and transparencies taken from it.

The meeting was brought to a close by a vote of thanks to the Chairman.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 2nd March, M. PELLEGOT in the chair.

The SECRETARY called attention to the forthcoming photographic exhibition at Amsterdam, and announced to the members that applications for space must be made before 15th July.

A letter was read from Mr. Sahler in which he announced the fact that he was occupied in the elaboration of a photo-chromic process of a purely chemical and physical character.

M. PERROT DE CHAUMEUX gave an abstract of the foreign journals.

Mr. BADEN PRITCHARD's paper on reticulation in carbon tissue was brought before the Society.

M. FRANCK DE VILLECHOLLE read the report of the Commission appointed to examine the *laveuse hydraulique*, or washing apparatus of M. Collet. The verdict of the Commission was that the apparatus was a very useful one, and capable of rendering good service to the photographer; some defects, however, were pointed out.

M. FRANCK DE VILLECHOLLE gave his opinion of a sample of

carbon tissue from the manufactory of M. A. Braun. He said the material in question was remarkably fine and soluble, and submitted some proofs upon glass. He was glad to see that several firms were now engaged in the manufacture of carbon tissue, as in this way progress was sure to be made.

M. LIEBERT said the Braun tissue could be favourably compared with that from the Autotype Company, of which he generally made use.

M. HARRISON, while confirming the above opinions, said the tissue was apt to become brittle.

M. CHARDON bore testimony as to the good quality of the tissue made by M. Monckhoven.

M. FRANCK DE VILLEHOLLE announced that the Syndicate of Photographers, which occupies itself with the art from an industrial point of view, as the French Photographic Society cherishes the scientific aspect, had resolved in future to devote a portion of its time to the consideration of photographic patents.

M. DAVANNE remarked that the exercise of such a supervision as this could not but be beneficial to photographers, by looking after their interests.

M. FLEURY HERMAGIS submitted a model of a lens-cap, called the guillotine cap.

M. DARLOT called attention to the fact that he had submitted a somewhat similar instrument some time ago.

M. GILLOT submitted a number of photographs in half-tone produced in the printing press; they were, however, not taken from nature, but M. Gillot expressed a conviction that in a little while he should be able so far to improve the process as to render negatives taken direct from nature available in such work.

The Society thanked M. Gillot for his presentation.

The proceedings then terminated.

Talk in the Studio.

FIRE AT A PHOTOGRAPHER'S.—On the morning of the 29th ult. the flock works of Mr. Archd. Robertson, photographer, Dumbarton and Glasgow, secretary of the Glasgow Photographic Society, were almost totally destroyed by fire. The whole place is a total wreck. The machinery, both for the manufacture of flocks, wadding, and the making of bolts and rivets, is almost totally destroyed. The damage is about £2,000. The place was not insured. The origin of the fire is at present unknown.—*Glasgow Herald*.

MISAPPLIED PHOTOGRAPHY.—At the Birmingham Police Court on Tuesday, Alfred John Grattidge, photographic artist, pleaded guilty to circulating indecent literature, and was sentenced to twelve months' hard labour, in addition to a fine of £5. Last week a large number of photographs, songs, and books, including several copies of the "Fruits of Philosophy," found upon the premises of the prisoner, were ordered to be destroyed. The learned Recorder expressed a hope that the Watch Committee would reward Detective-Sergeant Black for the ability he had displayed in catching the prisoner and bringing him to justice. The prosecution was conducted by the Society for the Prevention of Vice.—*Daily News*.

PHOTOGRAPHS TRANSMITTED BY TELEGRAPH.—If there be nothing new under the sun, there are at least many things that strike one in a novel light. To wit, when the old philosopher illustrated the law of the gravitation of the earth by bag, clay, stick, and nut, he little thought he was paving the way for cocoa-nut—"three shillings a penny!" And, assuredly, the early inventors and adapters of the electric telegraph never imagined that photographs would be transmitted by the wire of electricity. Though photography is within our departments, we should not enlarge upon this point were it not for the fact that science is the great parent of toys. The original character of the picture has to be slightly altered, and the paper to be chemically prepared, and visible marks result where points in the electric circuit come into contact with the paper. Tinfoil has been used in experiments already successfully conducted, and the photographs have been reduced to lines.—*Stationer*.

To Correspondents.

D. WALKER, Duffield.—We will make enquiry, and see to cause and remedy, if possible, of the irregularity. Your specimens are very interesting, and the portrait by no means badly lighted. The lens you mark No. 2 will probably suit your purpose best.

INSTANTER.—The rapid rectilinear is, we believe, quicker than the triple lens of the same maker.

T. J. P.—With a brilliant negative and sufficiently deep printing almost any toning bath will give similar tones. The lime toning bath answers well for producing such tones. Take two grains of chloride of gold, one grain of chloride of lime, and twelve ounces of water. Mix, and allow to stand forty-eight hours. But remember that a weak negative, which only permits light printing, will not yield deep tones with any bath.

YORK.—We do not know of any remedy for greasy mounts except discarding them and obtaining others. The addition of a little ammonia to your adhesive material may assist you.

NORTHUMBRLAND.—Yellow spots in the finished print arise at times from a variety of causes, such as defects in the albumenized paper, the mounting material being acid, defective cards, the presence of dust containing chemicals, &c; but in the example sent, each spot has the appearance of distinctly imperfect fixation, which might arise from a multitude of small air-bells forming on the print when it was immersed in the fixing bath, and so preventing the proper action of the hypo. This would produce small spots of imperfect fixation, which would not show until the prints were in the washing water, or, still more frequently, not until just after mounting. 2. White is the best colour for securing good reflecting action in a reflecting screen. Grey may be used, but it will reflect less light. The best mode of avoiding the strong reflection of light in the eye is to turn the eyes somewhat away from the reflector.

DUST.—The nature of the powder to be employed depends entirely on the purpose to which the process is employed. If for producing enamels, vitreous colours must be used; if for reproducing negatives, plumbago is generally used; if for producing pictures, then the colour must depend much on the aim and taste of the artist. Carbon is frequently used in the shape of ivory black; sepia, umber, and other powder colours are available.

A WOULD-BE RETOUCHER.—If our correspondent had been an experienced retoucher, he would readily have seen the use of the pencil of lead, which is very valuable in securing light, delicate touches difficult to produce with the ordinary blacklead pencil. But if it were a "sell," as our correspondent suggests, he is quite mistaken in supposing that it should in any way devolve upon us to investigate and expose it.

DEVELOPER.—The best strength for a developer depends upon various conditions, such as the kind of work, the kind of light, the condition of the other chemicals, and the mode of working. The formula you quote, containing one ounce of saturated solution and thirty ounces of water, would give a nine-grain developer, which, for landscape work, would work, under ordinary circumstances, very satisfactorily. For portraiture we should, as a rule, prefer a fifteen-grain solution. A solution containing from thirty to fifty grains per ounce we should regard as a very strong developer, too strong for ordinary use. A saturated solution of protosulphate of iron (FeO, SO₄ + 7Aq) consists of six ounces of the salt in ten ounces of water at 62° Fah. This on the authority of "Storer's Dictionary of Solubilities," the authority on such points. The other writer you quote has made an error. Forms of protosulphate of iron exist containing smaller proportions of water of crystallization, and these are much less soluble. That to which we refer is the ordinary commercial article.

A WOULD-BE EXHIBITOR.—The nominal time for applying for space at Paris is passed; but if you apply at once, we have no doubt of your success in obtaining space still. But the sooner such applications are made the better, as having all the applications before them materially aids the authorities in allotting their general space, and making generally satisfactory arrangements.

LEGATRE.—You are right in congratulating yourself on the fact that you, in common with photographers generally, are the heirs and legatees of the pioneers of the art. But you are in error in some points. The originators of photography patented their processes. M. Daguerre, although he received a pension from the French Government for the free publication of his discovery, patented it in this country, and the patent was purchased and worked by Beard; much piracy and much litigation being carried on in the early days. Mr. Fox Talbot also patented his processes. The collodion process, although properly enough associated with the name of Archer, was, in fact, the combined work of many persons, and could not very easily have been patented by one. Mr. Archer did patent a much smaller thing in a mode of transferring the collodion film by means of gutta-percha. The mode in which a patent becomes an advantage to the public is two-fold: in the first place, it gives the patentee a beneficial interest, which renders it profitable for him to work his process out to a practical success, which, as this often involves the expenditure of much time and money, would not have been worth while for anyone to do without the chance of being reimbursed which a patent secures; and in the next place, a patent secures publicity, and is opposed to the secrecy which some inventors preserve. As a rule, those object most loudly to patents who have never originated anything themselves.

CARBON WORKER.—A correspondence consisting chiefly in word-fence is undesirable to continue. Several Correspondents in our next.

The Photographic News, April 20, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO THE CAMERA AS CLERK AND DRAUGHTSMAN—THE ADVANCE OF SCIENCE BY MEANS OF REWARDS—AERIAL PHOTOGRAPHY.

The Camera as a Clerk and Draughtsman.—Seeing that photography has made its way into so many different channels, it is, perhaps, not surprising to find the art entering our big Government offices. It may be some time before the camera replaces the city clerk, and reduces the prestige and salary of the latter within still more narrow limits; but already there are signs of photography taking the place of clerical assistants and draughtsmen in large establishments, and from the circumstance that it does the work more trustworthily and rapidly, there is every likelihood of its retaining its foothold in those quarters. In many engineer establishments and factories, where plans and sketches have to be copied, the work is done by the aid of photography, the original being simply placed above some prepared paper, and the two sheets kept in contact with one another with a couple of glass plates held together with American clips. Silver paper, such as that prepared by Carrier, is sometimes resorted to for this work, but generally the prussiate paper manufactured in Paris, and also, we believe, by the well-known firm of Marion and Co., of Soho Square, which yields a white-lined sketch on a blue ground, is employed. This paper may be purchased in very large sheets, and will keep good for months before it is used. Its manipulation is exceedingly simple, and requires no practised hand; a few washings is, indeed, all that is needed. Scientific gentlemen employ the same means for copying their calculations, after they have been at the trouble of working these out, and in this way obviate the chance of any error creeping in during the process of copying. The late Sir John Herschell invariably made use of this plan of preparing copies of important notes and data, and in this way always had his own handwriting and figures to refer to. In the preparation of copies of important documents which pass through the War Office, the camera is not unfrequently had recourse to, we hear, especially when the same are expressed in a foreign language, or contain a mass of figures the correctness of which might suffer from clerical reproduction. Besides the trustworthiness of the camera as a copying medium, its rapidity is also a quality that cannot be made too much of. By unstitching a pamphlet, and spreading its pages out upon a flat board, the former may be wholly copied in a few minutes, a task which, in the case of a strange tongue, would involve days, if not weeks. Again, tabular statements, or calculations made to assist in working out problems, whether of a scientific or general nature, may in the same way be quickly reproduced without fear of error or misunderstanding. The camera never makes a mistake in a figure, or fails to dot an i, and for this reason can always be trusted to perform clerical work with the strictest integrity and trustworthiness.

The Advance of Science by Means of Rewards.—Some weeks ago we took occasion to express our disbelief in any good being likely to accrue from endowment of research, and gave it as our opinion that nothing extra would be found out now that Government had resolved to spend the sum of £4,000 upon scientific investigators. Our main argument, it may be remembered, was to the effect that the money was hardly likely to come into the hands of those who had a claim to it, or really wanted the cash; and in any case, a man would not withhold an invention or discovery from the world for the sake of a few pounds more or less in his pocket. The popular idea is, that if you want to find anything out, you have only to proclaim a prize, and the problem is solved forthwith; How fallacious such a view is may be seen from the recent

action of the French Photographic Society. This body some months ago, determined to offer a reward for a good dry plate process, which should have all the advantages of the wet method, with any others that the discoverer might communicate. The affair has come to an end, and what is the result? Why, that there was no competition at all. There was practically only one process submitted, for other two which were sent in did not even meet the general admission regulations which had been drawn up. M. Alfred Chardon therefore walked over. We do not know what the process is that has gained for M. Chardon the honour, but since the gentleman himself admits that it is not new—by which we suppose he means that he did not work it out—we fail to see how he became entitled to the award. It is an emulsion process with alkaline development, it is said, so that it would have been absurd, indeed, to have claimed novelty. There may be, and probably is, some peculiarity in the manipulations peculiar to M. Chardon himself, but we never knew a dry plate worker yet who did not have a fad of his own. Granted that M. Chardon's process is an excellent one, as it is very likely to be, we shall be surprised, indeed, if it is superior to the many excellent processes that have appeared already in these columns and elsewhere, and which have been freely given to the world without any heralding or trumpeting forth whatever. If M. Chardon's process is a good one, it would have become known quite as readily without any prize being offered, we contend, and the making of this award, therefore, has had little to do with progress.

Aerial Photography.—The subject of making photographic observations from balloons is one which has received but very scant attention in these days of scientific progress. A military balloon committee is, we believe, still sitting at the War Office, but the gentlemen composing it have not, we hear, yet discovered a satisfactory medium for floating the machines, and, consequently, have not yet discussed the subject of taking observations. In Paris, two years ago, M. Nadar, the eminent photographer aeronaut, made many experiments in aerial photography, and, according to our French Correspondent, succeeded satisfactorily in accomplishing the difficult problem of securing camera images from a balloon. The late Sir Charles Wheatstone, who had seen M. Nadar's productions, informed us that they were the most successful aerial photographs he had seen, but that much was still required to render the *modus operandi* perfect. The gyrations of the machine, and its unsteadiness, even when tethered to the ground, were so great that only instantaneous work could succeed. Some pictures which we have seen of Boston taken from a balloon are very good, but they do not take in a very large field. They were obtained by the aid of a stationary balloon, and they certainly give results invaluable from a military or geographical point of view. The First Napoleon was so impressed with the advantages of balloons as a means of observation and of *reconnaissance*, that he organised a balloon corps, which accompanied the army in the field. With a camera to aid him, the observer could make his observations, and map out the ground before him, far more quickly than if he had but a field glass to help him. But it would be necessary to have his instruments ready, and also to settle upon and arrange a perfect system for instantaneous work; for otherwise, as one can well understand, the novelty of the photographer's position, and the circumstances under which he has to work, would interfere materially with his operations. To carry out his task rapidly and skilfully must ever be the object of an aerial photographer; but how to accomplish this is a problem evidently yet to be solved. Mr. Glaisher, the President of the Photographic Society, is one, however, who could materially help with suggestions, for the seventy or eighty ascents he has made constitute him the recognised scientific aeronaut. His experience on this particular subject is probably not shared by any other scientific man.

ON PLATINOTYPE.

BY THOMAS RODGER.*

THERE is a great charm about these pictures so produced on plain paper, the tones resembling those of a warm engraving. Added to their beauty and the rapidity of production, they resist all the usual destructive tests. By a very simple experiment I think I can illustrate to you the whole chemical action involved in this process now detailed. We have here the yellow powder ferrous oxalate, the same which by the action of light is formed from the ferric oxalate, and which forms the visible picture. Now if I, by the aid of a little heat, dissolve this in potassic oxalate, and bring it in contact with a solution of platinum, you will observe instantly a deposition of this metal in a dense black finely-divided form. This is precisely what occurs on the exposed sheet when it is passed over the potassic oxalate bath, only that the deeper shadows and gradations of the negative under the action of the light affect more or less the amount of reduction.

I am not aware that this process has been demonstrated in any of the photographic societies in Britain. Hitherto I believe that Professor Stebbing brought it before the French Society in Paris, and demonstrated it successfully some time ago. I purpose now, therefore, to occupy a few minutes in doing the same before you. For this process any kind of surface may be employed, provided it be somewhat porous, and it is better that it should have received a coating of organic matter in the form of gelatine (or, preferable, arrowroot). In the commercial prosecution of this process, ordinary photographic or other good quality of paper is treated with arrowroot. This is now placed for a moment on a weak solution of nitrate of silver (six grains to one ounce) and dried. In this form the paper may be kept for an indefinite time. When it is requisite to produce copies it is only necessary to take a solution of the chloro-platinite of potassium, and a solution of ferric-oxalate mixed, and coat the sheet therewith. Dry, and expose under the negative. The picture on development may, as we have said before, be considered beyond the reach of change, but the colour of it is rather too black to please, and, therefore, it is desirable to modify it, and this is readily done by subjecting it to a solution of gold for a short time. After the desired colour is obtained it should be put into a weak solution of hyposulphite of soda or solution of chloride of sodium for a few minutes, and from that to water; and finally, in order to remove all traces of the ferric oxalate, the print should be placed in a weak solution of oxalic acid for as short a time as may be considered necessary, and then, with a slight amount of washing, the picture may be hung up to dry. If it be desired to give a finished-looking or glossy surface to the print, this can be done by various methods; as is generally the case, the depth of shade and gradation is made more attractive.

I shall now proceed to illustrate the operation. I have brought with me a few sheets exposed to-day before I left St. Andrews; these I shall develop. After I have prepared a sheet, I shall hand for your inspection the sheets exposed this morning, and you will observe that there are two of them equally visible with the others; but you will observe them marked as having been prepared without platinum—only with the ferric salt on the exposure to the potassic oxalate bath they will entirely disappear, owing to the solution of the ferrous oxalate, no reduction being possible.

I presume that you are aware that Mr. Willis has secured a patent for this process in this country, and that he has entered into arrangements, and is associated with, in this matter, the Albion Albumenizing Company, of Glasgow and London, which Company have the right of dispensing licences. I learn that very recently the process has been also patented in France, and that a firm there have absorbed the right in that country.

The specimens of prints which I now submit to you are from several sources, and a number of them have been by myself subjected to extreme tests, in order to prove the indestructibility of the image. There is one marked as having been for twelve hours under the influence of sulphuretted hydrogen, and the half of the same picture was immersed for an additional twelve hours in the acid solution employed to form the gas. Others have been for six weeks on a floor constantly wet, and subjected to treatment only short of being trodden upon, and you will observe that there is no change whatever.

Mr. Willis has nearly completed his researches in the matter of producing an emulsion with a view of still more simplifying the process, and when he returns from his journey to the West we may expect to hear from himself on this subject. Trusting that I may not have wearied you in the foregoing remarks, and that a spirit of enquiry may be aroused on the subject, I now conclude with many thanks to you for your kind patience and attention.

LANDSCAPE PHOTOGRAPHY.

BY JOHN PARKER.*

WE have not yet reached that stage in photographic progress where clouds and landscape can be satisfactorily rendered in the same negative—at least, this can only be done under very exceptional circumstances; and the fact is that we must either sacrifice the sky to the foreground, or the foreground to the sky. Sky-shades and similar adaptations are very useful in their way, especially in preventing the obliteration of a delicate distance; but it remains true that only in the hands of the most skilful operators do you get a negative satisfactory both as to the landscape and the sky.

Perhaps the interesting suggestion to use a Nicol's prism attached to the lens may point the way to some practicable and practical solution of the present difficulty; but, until then, we must be content to produce the cloud effects in prints by a second printing from a cloud negative.

Of course it is best to take such cloud negatives from nature, and with a few such negatives, giving different characters of sky, and different directions of lighting, great variety may be produced. But with myself, my opportunities of a day in the country with the camera—that is, a *suitable* day—are so rare that I am always inclined to turn my attention to the landscape, and trust to some other means of producing the sky effects. As possibly this may also be the case with some other amateurs I take this opportunity for describing the method I now generally adopt.

I have from time to time tried various methods, but the chief of these have been either to paint in cloud effects on the negative itself, doing so on the *back*, so that the lines may be softened by diffusion in printing through the glass, and in this way only one printing for foreground and sky is necessary; or, to paint on thin tracing-paper, with china ink, a series of cloud negatives, one or other of which may be used, according to the subject of the landscape, for a second printing. The first method is only available in negatives where the sky is very thin, and the results, at least in my hands, are not very satisfactory; I therefore almost always employ the second method, which I find gives very good results if carefully used. They present this, among other advantages—that by merely turning the one side of the paper, or the other, you may change the direction in which the clouds are lighted, so as to suit the light in the landscape. And I would here suggest that the same advantage might be obtained with cloud negatives taken in the camera by removing them from the glass, and transferring them to a transparent gelatine or tracing-paper support. I do not use a printing-frame with these paper negatives. Taking the print from the frame with the landscape only printed, I pin it on

a board, and cover the foreground with a stout paste-board, or any such thing, having first laid down the cloud negative in the most suitable way for the particular subject; this, of course, all in yellow light. Then with cotton wool I shade off the sky line of the landscape, the wool being under the edge of the paste-board, so that the latter keeps it in position, while the wool prevents the sharp line which the paste-board would make in the print.

If the sky be broken up by trees or otherwise, so as to be seen in patches only, I cut holes in the protecting paste-board somewhat larger than the patches of sky to be produced, and fringe these holes round with the wool (the cloud negative, of course, being always under the wool and pasteboard, and next to the print); then laying a weight on the pasteboard to keep all in position, I expose it. In practice, I have a number of pasteboards with different-sized holes always ready at hand, and it is easy to alter the size of these to suit any particular case on a moment's notice, by selecting one larger than is wanted, and filling up the excess of space with a fragment of brown paper or an extra supply of cotton wool.

It only remains now that I very briefly give the formulae I employ, in which, however, there is absolutely nothing new. First, then: for wet plates in the field I use old collodion sensitized at least six months—longer if possible—and a distinctly acid bath. For developer I use Mr. B. J. Edward's formula, namely—

Sulphate of iron	...	...	1 pound
"	"	and ammonia	1 "
"	"	copper	1 ounce
Water	...	...	87½ ounces

This gives 160 grains to the ounce of water.

I carry one ounce of this in a dropping-bottle, and another bottle with acid water, in the proportion of one of glacial acetic acid to thirteen of water, with spirit of wine as may be required. Both of these I keep ready in stock in my laboratory, and fill the tent bottles just as required. For a seven by nine inches plate I pour into a wide-mouthed bottle, which I use as a developing cup, three-quarters of an ounce of the acid water; and as every drachm of the iron solution contains twenty grains, I can at once suit the strength to the subject, the light, and the exposure. I always give a long exposure to take up all that is in the shadows; and, if there be a great range of distances, I add just about twelve to fifteen drops of the iron to the three-quarters of an ounce of acid. This gives a strength of a little over five grains per ounce, under the action of which the delicate distances come out; and then I strengthen with other fifteen up to thirty drops, as may be required to bring up the foreground. I generally finish on the spot, and to save copious washings in the tent I strengthen, if need be, with iron, citric acid, and silver, as it is then unnecessary to wash from the first developer. When density is obtained I pour on a few ounces of water, previously placed in a six-ounce bottle in the tent; then, opening the door of the tent box, I take out the tray with the negative, wash thoroughly and in freedom in the open air, and clear with the cyanide, which I always keep in a bottle in my pocket, marked legibly "poison."

The formula for the hot-water process is exactly as in the *British Journal*, including the final wash of gallic acid, unless the plates are to be exposed within a few days after the preparation. With the gallic acid they will keep for months; but I always try to have them developed as soon as possible after exposure—say within a week or so, or sooner if no gallic acid be used. After rinsing with water, before applying the gallic acid, I flood with a little distilled water. I should have mentioned, also, that after removal from the silver bath I soak in two trays of distilled water, and then rinse well under the tap, finishing with distilled water before pouring on the albumen. The first washing, at any rate with distilled water, I think very important, as, unless the water be pure with which the free nitrate of silver is removed, insoluble salts of silver may be formed

on the surface of the plate, which may seriously modify the after-results. The extent of this evil will, of course, depend on the nature of the water used for washing; but, unless the composition of the water be known, it is safest to take the precaution of beginning and ending with distilled water.

The formulae for the collodio-albumen or Taupenot plates are numerous, and I have used sometimes one, sometimes another, without noticing much difference. That of Mr. Price is very good, only I prefer to pour on the albumen instead of using it in a bath, as I think the bath method is more liable to cause air bells in the albumen, of which it is very difficult to get rid. His formula for the albumen is as follows:—

Albumen	...	...	8 ounces
Water	...	...	1 ounce
Glacial acetic acid	...	...	24 drops.

Stir well up for two or three minutes with a glass rod, and after rest for an hour, strain through muslin; then add half-a-drachm of the strongest liquor ammonia, and iodise with forty-two grains of iodide of ammonium and six grains of bromide of ammonium. With a small bit of camphor in it, or a few drops of carbolic or salicylic acid, it will keep good for years—certainly for a whole season.

The collodion, both for this and the hot-water process, should be open and powdery, so as to give a surface, when sensitised, that will receive and retain as much of the albumen as possible. *Steps of Process:*—1. Dilute albumen subtratum. 2. Collodionise. 3. Sensitise. 4. Wash well. 5. Bath of common salt. 6. Wash well again. 7. Flood with albumen, and pour off first dose in the sink; flood with second dose, and let it flow back and forward so as to sink well into the film. 8. Drain till surface-dry, then dry in hot water bath at boiling point. All this may be done in daylight, and the plates in this stage will keep for years, so that a large stock may be prepared. When wanted for use, lay, face down, on a fifty-grain aceto-nitrate bath for about half to three-quarters of a minute—not longer; wash thoroughly—first in a bath of distilled water, then under a tap, finishing with distilled water. Finally flow over a two- or three-grain solution of gallic acid, and dry without heat. No backing is required, and they will keep a long time in good condition.

Alkaline development is suitable, though they may also be developed with plain pyro., and finished with acid silver.

OXYGEN-PRODUCING APPARATUS.

BY M. NOTON.*

I HAVE another change in oxygen machinery to show you to-night; but before I open my budget I must first congratulate Mr. Chadwick on his production in that line at the last meeting of this Society.

It appears to be clear now that there are only two ways of using a mixture of chloride of potash and manganese—either it must be in the loose state, dry, or damped and moulded into solids of any convenient shape. The first condition will belong to all fixed plant and filling gas bags for customers. The second relates to portable apparatus. The fastening of the plug to the bottom of the inside of the retort has always been a great hindrance. Mr. Chadwick has grappled with this difficulty in his cakes by having a subtratum of manganese only in contact with his hot cast-iron plate.

During the last two years or so I have tried several ways to stop the adhesion. First, I coated the inside of the retort with a thick wash of whiting and water, also with clay wash. These did pretty well for one or two plugs, but the coating came off soon, and had to be renewed. As this was unsatisfactory, I tackled the plugs themselves; some were chalked all over, and others had whiting, red ochre, and clay wash. The wet plugs from the mould

* Read before the Manchester Photographic Society.

were covered with fine black oxide of manganese, but they were too tender to bear rolling in it; all this involved more labour and time. Then there was the swelling of the plug when the gas came off. The obvious remedy for this is to have the retort larger inside. When a plug is too large it not only is cemented to that part of the metal it rests upon, but fills up the inside so much that there is no getting it out comfortably. This defect I tried to remedy by making a hole through the other end of the retort. I could then drive the plug out. This involved an additional quantity of tackle for closing that hole. I afterwards made a retort tube of equal bore throughout. This was used at Mr. Brothers' lecture on the transit of Venus, and it is now part of the new machine, with the exception that it would be better if of a larger bore. I cannot see that there is any room for further improvement, the connecting or disconnecting being so prompt.

This new arrangement may be considered to be of the parallel vice type: in fact, it is one, the jaws being "stepped" by two brass cups for holding the retort tube over the nine jets of aerated gas. The retort tube has a temporary handle fitted to it, and this tube so provided is the only loose article about the machine. The tube will generally be hot, but need not be touched, so that that objection is put out. Apparently the next serious difficulty is getting the cooked plug out of the hot retort. On the supposition that the bore of the tube is large enough to allow for the expansion of the plug, there remains only the adhesion to overcome; when that is broken all the rest is easy. To do this I intend to make a screw pusher; there will be an abutment similar to one of the vice jaws, provided with a brass cup having a hole through as large as the bore of the retort tube; at the other end there will be a screw. One end of the hot retort tube will be put to the abutment, a few turns of the screw at the other end will soon make the plug move on, and that difficulty will have been got over without any especial preparation of either the retort or the plug. I am certain this will be the result. By slackening the grip of the vice a little the retort may be rotated nearly two-thirds of a revolution. When I first began to make plugs I dried them on the top shelf of the oven. I could smell them, and having an idea that I was drying some of the oxygen off, I gave up that practice, and let them dry slowly.

The easy rotation of the retort tube pointed to a theory I had. My impression was, that although a plug appeared to be dry, it yet contained water of crystallization in the chlorate; that this water came out as vapour, condensed on the colder parts, ran down to that part of the plug resting on the bottom, wetting it, and so causing the fastening. Now, I thought by turning the retort tube backwards and forwards it would be a preventative, as the plug could roll more than half a revolution. Upon trial the plug stuck as fast as ever. The next experiment made was to find whether this water came over as surcharged steam with the oxygen. The washing bottle was weighed, some short pieces of plug were cooked, and when the bubbling had ceased the washing bottle had increased in weight six grains. This was but a rough experiment, and intended merely as a preliminary.

(To be continued.)

AN ENERGETIC DEVELOPER.

BY ERNEST BOIVIN.*

FOR some time past photographers have paid attention to powerful developers. I read with interest, in one of the recent numbers of the *Moniteur de la Photographie*, the details of an accelerated developer in which sulphate of iron, sulphate of magnesia, and formic acid were the main constituents, the same being said to diminish considerably the time of exposure. This developer I experimented with thoroughly, and I must say I did not get any better results than those obtained by M. Baudoux. I found the same

defects that he has alluded to. Nevertheless, I utilized the indications furnished by the anonymous author, none of which helped me to secure more successful results.

It would be, however, a very important point if we could secure with facility greater rapidity by employing a developer more energetic in its action. If such a one could be discovered that would admit of a shorter exposure being given, it would, without hesitation, be employed in preference to all others.

In the meantime, before I make known the results of some new experiments of mine on the subject, I may say a word on behalf of an energetic developer which really does permit the exposure to be diminished, and which I have used for some time past with very good effect. Not only does it permit me to diminish the exposure by pretty well half, but it acts, too, with the greatest regularity, imparting always to the clichés particular softness and harmony. The negatives, indeed, possess a character of their own, and show very great detail. This is the formula I employ:—

Water	...	...	125 cub. cents.
Sulphate of iron	...	...	6 grammes
Sulphate of copper	...	...	2.50 "
Acetic acid	...	...	8 cub. cents.
Alcohol	...	...	5 "
Ammonia	...	...	A few drops.

After the ingredients are mixed together, the liquid is permitted to stand for a few hours, and is then filtered.

This developer will keep good from eight to ten days, but it is always preferable to use it when newly made, especially in the case of portraiture. As soon as the plate is ready to be developed, the quantity of liquid necessary for the purpose is poured into a glass or cup, and before it is thrown over the plate a few drops of a saturated solution of acetate of lead, made with distilled water soured with a little acetic acid, are added. The developer is agitated a bit after the lead solution is added. On the application of the developer the image appears gradually, the plate maintaining a very clean appearance throughout the whole course of development, and all the details appear in such a marked manner that it is in general unnecessary to have recourse to intensification.

The energy of this developer depends especially upon the addition of the acetate of lead to the copper-iron solution. It is known that the acetates and nitrates of lead have the power of augmenting considerably the energy of reducing agents, and to furnish, moreover, a deposit, the colour of which is particularly suitable for the film of a photographic cliché.

With the aid of this developer, the preparation of which is so easy, I obtain in ten seconds, in a room lighted up only by an ordinary window, portrait pictures which, if not exactly wonders, are, nevertheless, satisfactory as photographs and striking as portraits.

THE DEVELOPMENT OF EMULSION PLATES.

BY DR. LIESEGANG.*

THERE are, it is well known, two kinds of collodion-emulsion—that prepared by the mixing together of normal collodion, iodine or bromine salts, and nitrate of silver; and, secondly, that which is poured into water after preparation in this way, the insoluble portion being collected and dried, and afterwards dissolved again in alcohol and ether.

The first (unwashed emulsion) is poured upon the glass plate, and as soon as the film has set is put under a water-tap, or placed in a bath of water to be washed, when a preservative is applied and the plate dried. The operation of drying, by reason of the sticky, watery character of the preservative mixture, requires to be undertaken with considerable care, and it is only the silver bath that is dispensed with in the preparation of such plates. Whether there is any saving in the manipulation is, how-

* *Moniteur de la Photographie*.

* *Photographisches Archiv*.

ever, another question, because of the elaborate preparation of the collodion; and so long as emulsion plates of this kind do not afford us better results than wet plates prepared in the ordinary way, it will be a question whether there is anything gained by dispensing with the silver bath.

It is, however, another matter to work with washed emulsion, for in this case the manipulations are reduced to the simple pouring on of the collodion. This is a great gain to busy people, to those who do not care for much exertion, or to travellers who require to carry about with them no awkward dishes and inconvenient silver baths.

It is great advantage to work with washed collodion. The preparation of three plates, measuring nine inches by seven, may be accomplished in about five minutes' time. There are no preliminaries to be undertaken, no silver bath to filter, no dishes to clean or to fill with water, no residues or draining from the plates to collect, no preservative solution to make, filter, or apply, and, finally, there are no particular arrangements to be made for the transport of a large amount of baggage, a matter of considerable importance in the case of long journeys.

The unwashed emulsions give rise to a film from which the soluble decomposable ingredients crystallize out (the nitrate salts), and hence arises the necessity for removing such salts by washing. The application of water, however, removes the soluble nitrate of silver at the same time, as well as other substances necessary to the formation of a photographic image, and the consequence is that, after washing, the application of a preservative is necessary, consisting of a solution of gum, albumen, tannin, pyrogallie acid, salicine, &c. In the washed emulsion these injurious soluble substances have been removed by previous treatment with water, and for this reason no subsequent washing of the film is necessary, the so-called sensitizing substances being imported by bathing the precipitated mixture of collodion and bromide of silver in solutions for the purpose.

No stress ought to be laid, in photographic processes, upon the greater or less labour involved if the result shows a difference in the quality of the pictures. The end is the object to look at, and we should not consider whether a bath is to be used or not if superior results are secured in one way or the other. But if the results obtained are equally good in the case of two different processes, then undoubtedly the simpler of the two deserves to be chosen.

The washed emulsions, as they are now to be purchased in commerce, have been found to keep well in the hands of many landscape photographers, while this journal has given, by way of frontispiece, a proof of the qualities of pictures produced by the substance. So far as the cost of such emulsion is concerned, it may be remarked that for coating a dozen plates of twenty-one by sixteen centimetres, sixty cubic centimetres of emulsion are necessary; as the emulsion costs about forty marks (or shillings) a litre, the coating of a single plate of the size mentioned would cost about twopence.

In the preparation of three plates, five minutes, as already mentioned, is all the time required. To clean twelve plates of twenty-one by fifteen cents., and then to albumenize them, five-and-twenty minutes are necessary, and twenty-five grammes of diluted white of egg. The entire period necessary to clean, albumenize, and collodionize each plate is, therefore, about four minutes.

The development of dry plates is, generally speaking, very different from the treatment of wet ones, because the latter are developed in the presence of much nitrate of silver, contained, in a great measure, in the sponge-like film of the wet plate. Dry plates, on the other hand, have but little free nitrate of silver solution about them, the image being frequently produced by the action of the alkaline developer upon the difficultly reducible bromide and iodide of silver. The principal difference is that, in the development of wet plates, a vigorous picture is very soon produced, the colour of which, whether the plate has been exposed a long time or a short one, is always the

same, and does not change in any marked degree by the treatment to which it is subjected. In the case of the dry plate, however, we have a very thin image to begin with on development, which gradually acquires strength, and it is particularly in regard to this matter that we desire to say a few words.

Those who are not blessed with good eyes will be scarcely able to judge properly of the result produced by the application of pyrogallie acid solution (without acid or alkali), for the phantom picture is very difficult to watch in the orange light of a lamp or window. The difficulty in judging of the tone of the image in respect to its printing properties is also very great, and here we make a remark that there is generally a tendency to overdo the matter. Exposure, alkaline development, and acid intensifying must be kept in harmony with one another. The negative need not be so very dense, nor appear to the eye opaque, for it does not lose much of its density on fixation. Beginners are very apt to intensify too much. Of all the modes of development with sulphate of iron and silver, pyrogallie acid and silver, and pyrogallie acid and alkali, the last appears to be, in conjunction with silver intensification, the best suited for washed emulsions. After some hundreds of experiments undertaken in the course of last month, I have come back to this method, although it cannot be denied that by the defective application of the same the negative is much more easily injured than is the case when acid pyrogallie acid and silver are made use of. In the case of equal exposures, however, the negative developed by alkaline solution has much more detail than that treated with an acid liquid, and to secure similar results with two plates by alkaline and acid development, it is necessary to give the plate to be treated with acid solution two or three times as much exposure as the other. The main difficulty in the case of alkaline development is, as above stated, the difficulty of estimating the value of the phantom image first brought out upon the plate. If the alkali, whether it is ammonia, carbonate of ammonia, or carbonate of soda, is permitted to act too long or too vigorously without the addition of a sufficient quantity of bromine salt, there is produced, if the plate has been overexposed, a thin image which is found very difficult indeed to intensify. In the case of properly exposed plates, however, the images are developed clean, clear, and vigorous. To take a sunlit landscape with an apertic double lens of four centimetres' diameter, and a two centimetre aperture, an exposure of from six to ten seconds only is necessary.

To develop, I proceed as follows:—I take up the plate with the pneumatic holder, and cover it at one sweep with spirits of wine (any hesitation in this operation will give rise to streaks). This spirit is washed off after thirty seconds with ordinary water until the film does not appear to be greasy any longer. I then pour on my pyrogallie acid mixture, which consists of one gramme of the acid dissolved in eighty grammes of water. The outline of the sky appears in about twenty seconds, and soon after the half-lights of the image begin to come out. The pyrogallie acid is then poured off into a clean glass or developing cup, and mixed with three or four drops of bromide of potassium solution (1 in 24 strength) and ammonia (one part in eight parts of water), and with this mixture the cliché is still further developed until all details are apparent. The image is then washed, and an aqueous solution of citric acid (1 in 50 strength) is poured over it. This removes a fine veil that covered the picture.

The intensifying of the image is carried out with the same pyrogallie acid solution, mixed with a few drops of silver liquid made up of—

Nitrate of silver	...	...	...	1 part
Citric acid	...	...	...	1 "
Water...	...	...	...	15 parts.

The negative under this treatment remains beautifully clear in the shadows, and assumes an intense olive-brown tint.

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PARIS INTERNATIONAL EXHIBITION OF 1878.

As many of our readers are aware, the time originally announced as the limit within which applications for space to exhibit in the photographic department of the International Exhibition to be held in Paris, next year, has already elapsed. The necessity of an early knowledge of the space required, in order to aid in making the general allotments to departments, caused a somewhat unusually early date to be fixed as the time within which applications for space should be made and intending exhibitors in all departments were requested to apply and state the space required, not later than the seventeenth of March, now a month ago. We think, however, that we may safely assure readers who have failed to apply, and wish to exhibit, that applications now sent in will meet with favourable responses. Intending exhibitors should, however, lose no time in sending to the Secretary, P. Cunliffe Owen, Esq., C.B., at the offices of the English Commission, Canada Buildings, King Street, Westminster, for forms of application for space, which should be filled in without delay.

There is one difficulty which has possibly deterred some from making applications for space, who, but for this difficulty, might willingly exhibit. The general conditions of exhibition as stated in the papers issued by the English Commission contain an intimation that no wall space would be provided, there being no interior walls in the building. All exhibitors requiring wall space for their contributions must provide for themselves by the erection of screens, &c. Such a plan manifestly presents serious difficulties in relation to photography, as nothing could be more inconvenient than individual action in erecting a number of screens, each photographer one for himself. A suggestion is made in the conditions as to doing this conjointly with others. To do this efficiently involves a scheme of confederacy which there is no machinery to establish or work. Possibly the Photographic Society might, if duly moved to action, have established a committee to undertake the management of such an arrangement. Nothing of the kind has, however, been done, and many photographers we know contemplate with dismay the idea of erecting screens for themselves on unknown conditions, at an uncertain cost.

Ten years ago, when the last International Exhibition was contemplated in Paris, a similar difficulty existed at the outset. It was solved, however, in a manner very satisfactory to English photographers. The English Commission undertook the erection of screens, upon which the works of English photographers were exhibited, without cost to the contributors. Whether similar arrangements can be made for the forthcoming exhibition or not we are unable to say, but we have reason to believe that some

arrangements will be made to save photographers from the necessity of the individual action to which we have referred. But it is necessary, first of all, that a definite idea of the space required should be placed before the Commission. Hence it is important that any intending exhibitors should apply without delay. We shall take care to bring before our readers any further arrangements which may be made in relation to the display of their contributions.

SOLAR ENGINES.

THE sun has been made to do a great many things in its day, and just now there appears to be a good deal of talk in Paris, in scientific circles, of engines which are to be driven by the sun's rays. We do not suppose the engines in question have anything to do with Mr. Crooke's light-mill, as the radiometer was first termed when it was believed that light, and not heat, was the agency by means of which it acted, but are seemingly based upon the evaporation and condensation of liquids and gases. It is well known to chemists that some gases—like that of ammonia, for instance—may be compressed without difficulty in such a way that they represent a store of energy, and several suggestions are already before the world for securing motive power in this way. Mr. Maxwell Lyte, whose name as an early photographer is well known, is the author of an invention of this kind, the application which he desires to put it to being, we believe, mobile torpedoes. Already compressed air is employed for a similar purpose; but the air-pumps and complicated machinery necessary to charge machines with air at the terrible pressure necessary will be much simplified if ammonia can be employed instead.

In Paris, at the present moment, there are two solar machines which promise so well to become useful that already the Minister of Commerce has interested himself in them, and spoken loudly in their praise. These are the solar engine of M. Mouchat, and another machine, devised by M. Foucault, which is described as an ammonia machine to be driven by the sun's rays.

It would be premature to say a word for or against such projects before details of their construction are before us; but unless the sun pays us more frequent visits than it has done lately, or the machines are not dependent upon its shining, they will not be at work for long together. But it is, no doubt, solar heat, and not sunlight, that is required for working the newly-devised engines.

PHOTOGRAPHY AND LICHTDRUCK IN RUSSIA.

THE *Photographischer Archiv* publishes a letter from a Russian correspondent, M. Gustav Ra, who, writing from Jelefs, gives an account of mechanical printing in the land of the Czar. He says:—

In the following lines I have taken the liberty of giving you the particulars of a modification of the photo-lithographic process, which will doubtless be of interest to those who occupy themselves with such work. It is well known that transfers upon paper suffer from the disadvantage that the paper on being wetted expands and contracts irregularly, and the prints that are pulled off do not then correspond any longer, so far as dimensions are concerned, with the original image, a defect which is very important, whenever, for instance, topographical work is undertaken, the copying of maps, &c. For this reason tin-foil and other materials have been suggested to bear the transfer. The process I am about to describe is quite free from any unequal enlargement or contraction of this kind.

Good photographic paper, unprepared in any way, is washed in a weak alkaline solution to remove all trace of sizing, and is then dried by being placed between sheets of blotting paper. Or, if it is to be secured, so-called Chinese paper may be made use of for the same purpose. A sheet

of patent glass, well cleaned, is rubbed over gently with powdered talc, and then coated with normal collodion. As soon as paper and glass plate have dried, the paper is cut into pieces which are somewhat larger than the collodionized plate; these sheets are floated upon a solution of gelatine made up of—

Gelatine	...	...	...	1 part
Water	...	...	...	10 parts
Spirits of wine	...	...	...	1 part

Care is necessary to avoid air-bubbles during this operation, as also in the further one of placing the sheet upon the glass plate in such a way that the margins of the paper overlap the plate in every way. The paper borders are bent round, and made to attach firmly to the glass plate. The paper is next treated two or three times with the same solution of gelatine, and when dry the surface is ground smoothly by means of shave-grass. The smooth and even surface, well dusted, is once more covered with a carefully filtered solution of gelatine, and then dried again. Such prepared plates will keep a long time, and it is advisable that a stock of them should be kept.

To secure a print, one of the plates is dipped into a solution of—

Bichromate of ammonia	...	...	1 part
Water	...	...	12 parts

and permitted to remain therein until the paper appears yellow from the glass side. The adherent liquid is removed by means of filtered paper, and the plate is then dried at a temperature which should not exceed 20° Reaumur. If, instead of bichromate of ammonia, potash is employed, then you may safely employ temperature double as high as the one mentioned without the quality of the plate suffering.

The printing should be got over as rapidly as possible. The best results are given by a negative which is clear in the shadows and opaque in the whites; and the printing is at an end when the image is to be seen faintly visible from the glass side. As soon as the plate comes out of the printing frame it is washed in cold water, to remove all the undecomposed chromium salt, and, finally, by means of warm water, the still soluble gelatine is washed away from the exposed film. The last washing with warm or hot water must not be hurried; at the same time it requires to be thoroughly carried out in order to free the pores of the paper from every particle of soluble matter.

After the print has become perfectly dry, it is put into a bath consisting of one part of neutral tartrate of potash and eight parts of water, and allowed to remain therein so long as is necessary for the light parts to be thoroughly soaked. Taken out of this bath, it is put into another made up of one part of tartaric acid and ten parts of water. In this second bath the impression remains only for several minutes, and it is then taken out, drained, and dried between leaves of blotting paper. It is now ready for inking; but before you proceed to this last operation the plate is held for a few minutes over a vessel of boiling water, in order to impart to the print a slight degree of moisture, and then it is inked by passing over it a roller treated with a firm transfer ink.

If the operations have all been conducted with proper care, the image will, on the application of the roller, appear of exquisite clearness, and far before other transfers that are made in the ordinary way. Finally, the dry transfer is separated from the glass plate by cutting through the margins of the paper, and the same placed upon zinc or stone in the ordinary manner. The preparation of the transfer with tartaric acid is especially useful in the case of large surfaces of white, which contain but few lines, for the acid appears to preserve such portions, and to prevent them from being smeared with ink.

In conclusion, I may say a few words on the subject of Lichtdruck in Russia. That a process—which has so great a future before it—has already taken root in the country, may be proved by the magnificent works of M.M. Schindler et Mey, and the firm of Scheerer and Nabholz, of Moscow. A

few months ago I had an opportunity of visiting the arrangements made by M. Schindler for working this photo-mechanical process, and was truly astonished at the extent of the workshops occupied in this branch alone. Among many works that were in course of printing by Lichtdruck, and of which large editions are produced, two deserve especial mention, namely, an album on "National Russian Architecture," and another on "Russian Fabrics," the illustrations of which were all from negatives taken from nature, and would be of interest to others besides the inhabitants of this vast country.

TRANSATLANTIC WRINKLES.

BY LAFAYETTE HARRISON.

No. III.

I MUST premise right here, that the above heading is almost a misnomer, except in so far as the reader may glean fresh ideas by a method of deduction; yet that this paper may not go forth a foundling, but may be able to claim some relationship to its predecessors of the same name, why—let it stand.

The subject is, "The Difference between English and American Photography, examined through American Spectacles." But let no one imagine that I am about to undervalue Britannia's sun-painters, or to panegyrise Columbia's—"perish the thought!" I shall deal not so much with the skill of either, as with their appliances for working; and, further, endeavour to point out the manner in which certain advantages now enjoyed by those in the States may be introduced and adopted in the "mother country."

Light.—Ah! there English photographers are at a disadvantage. That beautiful sky, of deepest blue, roofing in the whole territory for two-thirds of a year, cannot be shipped from America, like the meat. No, we must be content with what we have, unless M. Scotellari can help us with his late photological discovery, which I doubt. One point alone can I see wherein any improvement may be proposed. It is this. Banish as much of that white (?) muslin, calico, linen, or whatever it may be with which you moderate (errata—*shut out*) your light, and substitute *white tissue-paper*. Your individual ingenuity will devise the readiest means, frames or what not, but of this be assured, if you are a master of lighting—without which, although a photographer, you cannot call yourself an artist—you will, if you have not already tried it, find that you have a new brush placed in your hand, with which finer pictures may be painted than you have ever yet produced.

Cameras.—English camera-boxes are made more strongly, more carefully, and are finished with more neatness than American; but at the same time a greater degree of accuracy can be obtained with the latter. The system, moreover, of focussing with the back of the camera, which runs in metal or hard-wood guides, is of great assistance. Dr. Vogel has so thoroughly exhausted this subject, that it would be superfluous for me to do more than express a wonder that English camera-box makers have not adopted the "sliding back, the lateral swing (for portraiture), and the glass corners to the 'kits' in the plateholders." Why do not photographers demand any obvious improvement? Stock-dealers will not take the trouble; it is not to their interest, they think; the movement must come from the buyers. One English improvement I have observed with much interest, viz., the "roller slide." It is so ingenious, yet so simple, that Americans may well adopt it with advantage.

Backgrounds.—Upon this subject I do not think that I shall find a dissentient when I state that American pictorial photographic backgrounds are, as a rule, artistic, and do much towards elevating photography; while, on the other hand, those sold in this country are, as a rule, such

deals, and oftentimes draws so out of perspective, that when used they eclipse whatever may be artistic in lighting and posing, and thus the whole is marred. There are exceptions, I suppose. I have not been so fortunate as to see them.

There are grand artists in England, and the theatres prove that there are also wonderful scene-painters. Why in the name of wonder cannot one of these gentlemen step forward and realize a fortune? From my short experience of Englishmen, I feel sure of this, that when a really good article is offered them they do not for a moment begrudge paying a fair price. Backgrounds as now sold here are too cheap to be good. In connection with this, I cannot refrain from mentioning the name of Seavey, whom I consider at the present moment by far the finest photographic background painter living. I never yet have seen one piece of even indifferent painting turned out of his studio—all are "o.k." I understand that Mr. Atkinson, of Liverpool, has become his agent. If this be the case, I would advise all first-class photographers who wish to adopt the best of everything to see them for themselves. I know nothing personally of either gentleman, and my advice is, therefore, disinterested.

Accessories.—Let me dismiss this subject with the brief remark that in both countries beautiful accessories are to be had for sufficient money, and proceed to make a suggestion that is not all my own, although I believe I first introduced it in the rough. I put it to each photographer if he is not always endeavouring to procure new furniture, so that he may have something different in his pictures? Do not "that eternal chair" and "that everlasting cabinet" become monotonous? You have turned them every conceivable way—except bottom upwards—and you are heartily sick and tired of them. What are you to do? Buy something fresh. You do so. It probably runs you into (say) from three to five pounds, if it is worth anything at all. At best, it is only one thing, and before the season is half over you are hankering after some other affair. Receipts will not permit further expenditure just then, and so you grumble away, and say what wonders could be done if you only possessed so-and-so. Now could not this be overcome by a

PHOTOGRAPHIC FURNITURE CLUB?

If some photographic society, or enterprising stock-dealer, would take up the idea, I fancy it would work well.

Let there be an annual subscription, varying in price, somewhat after "Mudie's" system of Class A, B, and C, in return for which the subscriber should have the use of photographic accessories, proportionate in value to the amount of his subscription, for a stated number of weeks, at the expiration of which time he could exchange it for other articles, or, if he liked, purchase it at the ordinary figure, less so much for amount of subscription, extending over the time it had been used. An annual sale would, with the subscription money, keep the thing running. I know of photographers who would gladly hail such an institution with joy. Think it over, and if it seems feasible let that vague "someone" who is always to do such things start the club, and see if it won't soon run of its own accord. This is the idea in the rough—shape it.

Albumenized Paper.—I have personally worked many English, German, and American albumenized papers, and state, as the result of long and varied experience, that a paper which I have tried, both in England and Germany, to procure for my friends, but so far without success, used extensively in the States, bearing the brand "S. and M., Dresden," is the finest make. It is a double-gloss paper, and of the two, pink and white, I prefer the former. Next to this I should reckon "Durand's;" then the "Cross Sword." Will not some one look around for this said "S. and M." and introduce it?

I had intended to touch upon one or two minor topics, but space will not permit.

PAINTING PHOTOGRAPHS.

BY JAMES MARTIN.

A SUBJECT which has come under recent consideration is the application of wet pigments and dyes to chemically-prepared surfaces, or, in other words, the tinting and painting of photographic pictures in water colours. Miniature painting, although it may be considered under this head, yet it may be executed by affixing a properly-prepared photographic print to the back of the ivory card on which the miniature is to be painted; its semi-transparency will allow the print to be sufficiently visible to enable the artist to trace its outlines and its shadows, if he allows it to remain affixed behind the ivory card will tend somewhat to shorten his labour. It may also be roughly tinted, the colour showing through the ivory card with good effect; but for my own part, were I about to paint a miniature, I, after having used the subjacent print to obtain the outlines required, should remove it, as the tints would be purer, and there would not be the risk of its being done by any ignorant or mischievous person, and the whole effect spoiled.

It now becomes necessary to take into consideration the chemical constitution of the colours, so that they may prove harmless to the print over which they are spread; this can only be proved by experiment and experience. I think some interesting facts might be discovered if such were made in this direction, but it may be presumed that what may be termed simple colours—such as the ochres, earth, and vegetable colours—will be more likely to prove innocuous than chemically-prepared substances. But I do not see how the use of some of these is to be avoided; such, for instance, as vermilion, which is a preparation of mercury and Prussian blue, which is a prussiate of iron; also Naples yellow, which is an arsenical colour, is sometimes very serviceable. Seeing this, I am somewhat at a loss what colours to particularly recommend in preference, as I have not experimented much in this direction. Also the style of colouring is somewhat peculiar, requiring the tints used to be bright and transparent, to overcome the heavy dulness of the shadows of the print. Thus it will be seen that if a print is to be merely tinted, opaque colours are not admissible; but should it be intended to produce a finished painting, both opaque and transparent colours will be required, thus allowing the artist the more extensive selection. As my practice was in oil colours, I can only give the palette I formed for that purpose; but I know that certain colours are changeable, and will fade, such as gamboge, Prussian blue, asphaltum, lake, sap green, and Antwerp blue; this more especially the case when used as water-colours. The selection I made, and which I have found to resist the effects of time, as oil colours, is as follows: Indian yellow, Naples yellow, yellow ochre, burnt ochre, raw sienna, burnt sienna, the madder lakes, burnt ditto, Indian red, light red, Venetian red, vermilion, raw umber, burnt umber, Vandyke brown, copper brown, Prussian blue, Guimet's ultramarine, black-lead, and ivory black. There may be others as useful and permanent as these, but as I have not used them, I do not give them.

I think if photographic prints were secured by washing them over with a thin spirit varnish before colouring, it would remove greasiness, and render the effects of chemical colours inoffensive.

AN UNPATENTED CARBON PROCESS.

Dr. Vogel describes, under this title in our Philadelphia contemporary, a process by Mr. Friedlein, of Munich. A little examination suggests, however, that it is, in reality, merely a colourable imitation of the process patented by Mr. J. H. Johnson, seven years ago. Dr. Vogel says:—

"In America there is at present a lively interest prevailing in regard to the carbon process, yet this process is debarred from general use by existing patents, not taking into

account the hindrance offered by the climate in summer. I think, therefore, I will be doing the American photographer a special favour, by informing him of a process (not patented) for producing pigment pictures, a description of which was first given by Mr. Friedlein, at Munich,* who has prepared a pigment tissue which he has brought into trade. For a sensitising bath he uses—

Bichromate of potassium ... 30 parts
Water ... 800
Carbolic acid ... 1 part.

"For transferring and developing, Mr. Friedlein takes, if a single transfer only is necessary, a separately prepared rosin-paper. First, dissolve 30 parts rosin or white shellac in 100 parts strong alcohol, and filter. Second, dissolve 30 parts gelatine in 500 parts warm water, and filter. To the clear solution add five parts glycerine. Mix both solutions, first and second, when warm, and keep it in well-corked bottles; put a coating of the warm solution on Rives paper, not too thick, and hang it up for drying. This is the rosin paper, not patented as yet.

"If you wish to develop a sensitized carbon tissue on this paper, you have to dip it, and also the tissue, in water; take both out, and press them together with the equegee, afterwards press them a short time between blotting-paper.

"They are then to be developed by means of warm water. The developed pictures must be dressed (tanned), and are then ready. They are inverted in position, and without gloss. If you desire to have them glossy, operate in the following manner:—Dissolve 80 parts borax in 1,500 parts of water, and add afterwards to the boiling solution 300 parts of shellac. Boil several hours till the lac is entirely dissolved. Afterwards add to four parts of the cold solution one part alcohol, and filter. A little bit of carmine added to the solution will give it a nice colour.

"As soon as the picture is rinsed with cold water, the shellac solution is to be poured on in a similar manner to collodion; then dry the picture, after which it shows a very fine albumen gloss. For a double transfer, Friedlein recommends only glass. He does not think much of a double transfer with flexible support. He pours over the glass plates a solution of 30 parts gum-dammar in 400 parts benzole; shake the gum at first in a bottle with a little benzole, whereby it receives a milky colour; then add the other parts of benzole, and filter through paper. This mixture is poured over the plates like collodion, after which let them dry; then the sensitized tissue, under water, is to be brought in contact with the plate and pressed on; afterwards developed. The developed picture, in a wet condition, is to be pressed together with the above-mentioned rosin paper, exactly as in the English process. When dry, the picture springs off itself.

"Should the pictures remain on the glass, then a glass without any coating is to be used, on which the pigment coating sticks very well. The picture is to be pressed on it and developed.

"You see by this that it is possible to make carbon pictures in another way than the patented one, and whoever has tried his hand in this manner will soon find further means."

VIOLET LIGHT IN THE STUDIO.

PROFESSOR STEBBING has something still to say for Scotellari's plan of using violet light. He suggests that the studio should be arranged to reflect violet light. Writing in our Philadelphia contemporary, he says:—

"A short time ago I was again invited, by a celebrated Parisian photographer, to be present at a new trial of Mons. Scotellari's idea of the violet light for studios. Although my friend, Mr. Gaffield, writes in your journal, 'From all that I can learn from intelligent photographers, &c., this appreciation did not hinder me from going to the

rendezvous in company with the Messrs. Downey, photographers to the Royal Family of England.

"The following experiments were made:

	Violet Light.	White Light.
1st. ...	15 seconds	15 seconds
2nd. ..	7½ "	15 "
3rd. ...	8 "	16 "
4th. ...	6 "	9 "
5th. ...	9 "	6 "

The first and last were in favour of the violet light, the three others in that of the white.

"Now it must appear very strange to the readers of the *Philadelphia Photographer* that, by an equal exposure, the same results are obtained in Paris, whereas, in America, Mr. Gaffield, and a gentleman who signs himself R. J. O., cannot come near those results. I will endeavour to explain this. The two last-named gentlemen are quite correct in their assertion, because they employ the violet light by transmission, which cuts off a considerable proportion of the chemical rays. Mons. Scotellari also cuts off some of the chemical rays, but by having the whole room of a violet colour he gains a certain part of what he has lost by the sum of light reflected upon the model, and so he succeeds in making a negative in the same time as with the ordinary light.

"I am convinced that if he had contented himself with only proposing that the walls, reflectors, &c., of the studio, and even the side lights, should be of a violet colour, he would have obtained a legitimate success; as it is, by grasping at the shadow he has lost the substance; whether it was from ignorance, or from a desire for 'filthy lucre,' I am at a loss to know. Honour would have been obtained by him had he informed the public that violet surfaces reflected the maximum of light received, and greater rapidity could be obtained by employing violet screens, &c. But no patent could be obtained to prevent photographers from painting their walls of a violet colour, or from using violet blinds, &c., so he was obliged to propose to paint or daub a violet colour over the glass in order to obtain a patent, and have a sale for his composition. In this he has hardly succeeded, and his proposition will soon fall into oblivion if Mr. Gaffield, or some other courageous gentleman, does not take the matter in hand, and make some experiments upon the violet light, not as a transmitted medium, but as a reflected agent."

Correspondence

ARTIFICIAL LIGHT FOR PHOTOGRAPHY.

DEAR SIR,—I was much pleased by reading the critique of Mr. Wilson's upon my idea of the phosphoric candle, which is not only given with kind and gentlemanly feeling, but also contains some valuable hints in furtherance of the object. As he observes, the idea is only a crude one, and requires careful experiment before it could arrive at perfection. I know that phosphorus burnt in common air evolves the dense vapour of phosphoric acid (PO) as he states, but I believe that this is generated much more slowly when burnt in oxygen gas. But it is so long since I experimented with phosphorus that I am not certain about the phenomena produced; but I recollect that the light was a most powerful one, and, I believe, for the short periods of time the light would be required for photographic purposes, that the slow accumulation of phosphoric acid would not prevent its use. Of course there would be required some sort of lantern or other movable appliance, so that the light could be thrown in the required direction upon the object to be photographed, and also that its acrid vapours shall be entirely excluded from the studio. With these remarks I must now leave the matter in the hands of those of your readers who have the time, inclination, and ability to pursue the object,

* See Die Praxis des Pigmentstreichens, by E. Friedlein. Munich: Published by Koenig and Hirsch.

and hope, for the sake of our art, soon to read that some ingenious brother has brought it to a practical termination.—
I am, dear sir, yours very truly,
5, Clarence Place, Ilfracombe, April 16th. JAMES MARTIN.

WHAT IS THE COST OF PRODUCING CHROMOTYPES?

DEAR SIR,—Being continually asked what is the cost of producing chromotypes, will you kindly allow me space in your valuable paper to quote my experience for the benefit of photographers generally? I will give the working of a band of tissue into cartes-de-visite, as the most easy for comparison:—

To produce 21 dozen, or 252	
cartes, one band of tissue ...	£0 7 0
One band transfer paper ...	0 2 6
Transfer collodion ...	0 2 6
Mounts ...	0 4 0
Wages for operator ...	0 10 0
Wages for spotting and mounting	0 5 0
	£1 11 0

I suppose this to be about the average quantity that will be produced daily in an ordinary studio, and I think a very easy day's work for an operator.

At the above rate the cost of producing cartes in chromotype is only one shilling and sixpence *per dozen*; and if we allow the enormous amount of 24 per cent. for waste and mishap, they are still short of two shillings *per dozen*.

If any photographer will honestly compare this with the cost of silver printing, and consider the advanced price that he could easily obtain for chromotypes, I think he will have sufficient courage at least to inquire into the supposed mysteries of carbon printing.—Yours truly,
116, Nevill Street, Southport. G. HIGGINSON.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second popular meeting of the session was held in Queen Street Hall, on Wednesday evening, the 11th inst., on which occasion a very large audience assembled to hear a lecture on Arctic exploration.

The rostrum, as usual, was occupied by Dr. JOHN NICOL, who introduced the subject by answering four questions: "What is the North Pole?" "Where is it?" "Why do people want to go to it?" and "What has hitherto prevented them?"

Some amusement was created by the answer to the second question, which the lecturer said was more difficult than the others, the Pole being, like all terrestrial things, subject to change, "here to-day and away to-morrow," only the to-day and to-morrow included, probably, thousands on thousands of years. The fact of a twenty-foot seam of coal, in which were to be seen leaf impressions, having been found within five hundred miles of the Pole, proved beyond doubt that a temperate climate had once obtained there, and equally so, he thought, that at that period the Pole had been in another place.

Arctic exploration from 1575 down to the expeditions of McClive and McClintock in 1858, was rapidly surveyed, and it was shown that till the latter date there had generally been a twofold object in view: the discovery of a north-west passage to India, and to reach the Pole; and that although the main object had, up to that time, eluded the grasp of the explorers, benefits had been conferred on both science and commerce of much greater value than anything likely to result from the finding of that which they went to seek. The various expeditions from 1853, when the discovery of the north-west passage left the Pole as the principal object of interest, to 1876, were next briefly noticed, and the rest of the time devoted to that with Captain Nares.

The lecture was illustrated by a series of transparencies from negatives taken during the cruise of the *Alert* and *Discovery*, and the pictures were exceedingly interesting, especially those depicting the manners and customs of the Eskimo, and the grandeur of the shores of the Palaeocretic Sea.

THE first out-door meeting of the season was held on Thursday, the 12th inst., the scene of operations being Cadzow Forest, near Hamilton. Special arrangements had been made with the Caledonian Railway Company, and the party left the West Princes Street Station at seven o'clock, and reached Hamilton at half-past nine. The early ride had whetted the appetite, and consequently full justice was done to a substantial breakfast, which the landlord of the Commercial Hotel had been telegraphed to have in readiness, and then they drove off to the Forest, high in hopes of a successful day.

The first halt was made at Barnclith, a most romantic group of three houses, erected in 1583, which crown a bank, rising in terraces to a height of 250 feet above the river Avon. The terraces are laid out in a quaint, picturesque fashion, and contain a number of fine specimens—if the adjective be at all admissible—of those absurdly ludicrous trees cut and trimmed and trained into the form of vases, globes, and domestic utensils generally, in which some of our ancestors so much delighted. From the outside, however, especially in combination with an old well, several fine combinations may be made, and here several plates were exposed, and then the party entered the Forest. The word forest, however, hardly conveys a correct idea of the place as it now appears. It occupies some 1,500 acres, and in pre-historic times must have been really a dense forest of magnificent oaks, under which sheltered large numbers of fallow deer and the ancient breed of the Caledonian ox, some of the descendants of which are still to be seen, and, especially the latter, are objects of interest to visitors from all parts of the country. The glory of the oaks, however, has long since departed, and all that remains are the, in most cases, hollow trunks of the largest, scattered here and there singly, and in groups of two or three, many yards apart. But although generally hollow, and of an age previous to written history, there is sufficient vitality left to annually clothe with foliage the wide-spreading though scraggy branches which yet remain, and give to the scene a kind of weird grandeur, as they link the present with the long forgotten past. On the outskirts of the forest, and close to the River Avon, stands the ruin of Cadzow Castle—or, rather, the remains of it—which is principally an ivy-covered keep, towering two hundred feet above the stream, which is here spanned by an ancient bridge, so that there is not only fine food for the camera, but plenty of variety.

Fortunately the weather was all that could be desired, just sufficiently hazy to give the much-valued aerial perspective to those who knew how to secure it; bright sunshine tempered with masses of white clouds, and hardly a breath of wind. The company were fortunate in having Mr. Annan, of Glasgow, whose private residence is in the vicinity of Hamilton, as guide, under whose charge the most picturesque places were selected without loss of time, and they soon broke up into groups, and every camera was at work.

In consequence of the picturesque richness of the ground, work went on rapidly, and by four o'clock all the plates had been exposed and several groups successfully taken, and the members prepared to drive back to Hamilton. Of course the usual comparing of notes took place, accompanied by the usual expressions of hopes and fears as to the results incident to all dry plate work, especially in the hands of those who can only indulge in an occasional day now and then. We may say that there were thirteen cameras in the field, and as a proof that the exhibition of apparatus has some influence for good, it may be mentioned that there were four of them new—one by Jonti, of Paris, one of Aird's, and two by Meagher, all of which were got under exhibition influence. There were in all one hundred plates exposed, for periods varying from a few seconds to forty minutes, and the processes represented included wet collodion, beer and albumen, uranium, gelatinobromide, Liverpool, Warnerke's tissue, and ordinary emulsion under various modifications.

Returning to the Commercial Hotel, the company sat down to dinner at five o'clock, Mr. Pantou, at the request of the President, taking the chair, and Mr. Muir officiating as Croupier. A day in the field is generally an excellent preparation for the enjoyment of a good dinner, and the present case was no exception to the rule, and mine host of the Commercial had reason to be satisfied with the appreciation of the really excellent provision he had made.

On the removal of the cloth, the Chairman said that he was glad the Secretary was not to bother them with the transaction of any business. He thought they had much reason to congratulate themselves on the large turn-out at this the first out-door meeting of the season, and hoped it might be a favourable augury of what was to follow. They had also reason to congratulate

themselves on the very favourable state of the weather, more especially as it had been so very different during the previous week. But most of all had they reason to congratulate themselves on having the benefit of the experience of their friend Mr. Annan as the guide for the day. It had often been matter of complaint that professional photographers did not take sufficient interest in the operations of photographic societies; but certainly that could not be said of Mr. Annan. They all knew how much time and attention he had given as one of the judges at the late exhibition. Some of them knew that only a week ago he had devoted a day in arranging the present excursion; and now they had seen how quietly and efficiently he had aided them in the work of this day. He had therefore much pleasure in proposing a full bumper to Mr. Annan, in the fullest knowledge that it would be heartily responded to.

The President (Mr. Lessels) then proposed the health of Mr. Pantou, who, he said, had really been the prime mover and life of the excursion, and who really had carried through so successfully the whole organisation. There were, he said, already several offices in the Society, but as they were about to remodel the rules, it might be worth considering whether they might not appoint a Director of Out-door Meetings, and if so, he was quite certain that in that office Mr. Pantou would be the right man in the right place.

Several other toasts followed, and the time passed pleasantly till 8.30, when the train was taken for the return journey. Shortly before the train started, the Treasurer, noticing the imperfect way in which the saloon carriage was lighted, disappeared, and returning shortly after, showed his usual fertility of resources in contributing to the amusement by placing on the table several packs of cards, a bag of peas to be used as counters, and two candles placed in empty castor oil bottles, by way of substitutes for candlesticks. By this means the monotony of the journey was pleasantly beguiled, and Edinburgh was reached at ten o'clock.

Thus ended one of the pleasantest of the many out-door meetings that had been held in connection with the Society.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting of this Society was held on Thursday evening, the 12th inst., Mr. THOMAS REYWOOD, Vice-President, in the chair.

After the minutes had been disposed of, Mr. G. T. YORSTON, Mr. JAMES CALVERT, and Mr. ROBERT BANKS were elected members of the Society.

Mr. NOTON read a paper on "Oxygen-Producing Apparatus" (see page 183), and exhibited his new retort. A conversation followed, during which the only noteworthy statement was made by Mr. W. CHADWICK, to the effect that he had found the substratum of manganese for his cakes (recommended at the last meeting) quite unnecessary, the cakes, after yielding their oxygen, being removed without difficulty.

Mr. D. YOUNG exhibited some emulsion plates on which drying lines were visible.

The meeting, which was well attended, passed a vote of thanks to Mr. Noton, and was then adjourned.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held at the Odd Fellows' Hall, Bradford, on Monday, the 9th inst., the meeting having been postponed a week later owing to the Easter holidays; Mr. SMITH, the President, in the chair.

The minutes of the previous meeting having been read and confirmed, Messrs. STANDFIELD and TERRY were elected members of the Society.

Mr. SACHS then read a paper—"Remarks on Studio-work."

Mr. WORMALD was of opinion that with regard to artistic feeling in photographs, some of the portraits by our best photographers were equally as good in light and shadow as the works of some of our best artists.

Mr. SMITH said there must always be some few photographers in advance of the rest; as, owing to the number of people in the profession, many perhaps had entered without any previous preparation, it was impossible that all should be equally fitted for the position, or qualified to be classed as artists.

Mr. GARRETT said that colour did not play a very important part in photography, and did not by any means constitute a work of art; and he was of opinion that if the public would give the photographer more time and a better price, he would then be better able to produce really artistic work.

Mr. E. GRAVES remarked, that it was a matter of great difficulty with the photographer to produce a different pose for (say) the twenty or thirty sitters he might have in one day, that is with the time he has at his disposal; but there was one thing he thought the photographer should avoid as much as possible, and that was the copying of other artists' productions. He had remarked that some of our leading photographers had a sort of pose of their own; indeed, almost a pose peculiar to themselves.

Mr. GARRETT said that at the Dublin Exhibition the photographs were classed with the Fine Arts, but he thought that could, perhaps, be accounted for by the fact that the photographs were considerably in the majority, a large number of photographers having applied for space for their exhibits.

Mr. COOK said that in his opinion the photographer and the artist were about equal, but, at the same time, he thought photographers had not done what they might in the way of posing.

Mr. SACHS said that the duty of every photographer should be to do his utmost to elevate his art, not merely by copying others, but by trying to excel in his own productions.

Mr. COOK showed a few photographs lent by Mr. Dallmeyer, being the productions of Mr. A. Kareline, of Nijni-Novgorod, Russia, who obtained the gold medal at the Edinburgh Exhibition, which were generally admired by the members present.

A vote of thanks was then given to Mr. Sachs for his paper, and the same accorded to Mr. Dallmeyer for his kindness in forwarding the photographs for exhibition.

The meeting was then adjourned.

Walk in the Studio.

FORMATION OF THE PHOTOGRAPHIC IMAGE.—At a recent meeting of the Physical Society, Captain Abney, R.E., read a paper on "The Photographic Image," prefacing it by a brief account of the two theories, the chemical and the physical, which are held regarding it. On the former, a molecule of bromide of silver is split up into sub-bromide and bromine, the latter of which is absorbed; and, on the latter theory, light acts mechanically on the molecule, shifting the positions of the atoms. Poitevin has done much to confirm the former of these by placing a film of silver iodide in contact with a silver plate, when he succeeded in obtaining an image both on the film of iodide and on the silver plate produced by the liberated iodine. Captain Abney has performed the following experiment. A portion of a dry plate which had been exposed was wet with a sensitive collodion emulsion of bromide of silver, and developed by the alkaline method; the films were separated from the glass and from each other by means of gelatinized paper, and were found to bear images; and the same result was obtained when the emulsion was added after exposure, development, and fixing. These experiments entirely disprove the supposition that only those molecules acted on by light are reduced. If the two films be separated by a thick layer of albumen, the lower picture develops as a negative, and the upper as a positive.

MORE MISAPPLIED PHOTOGRAPHY.—A few days ago, at the Thames Police Court, William Camerac, a foreign hawker, was brought before Mr. Lushington charged with causing an obstruction in the public streets, and wilfully exposing for sale a number of indecent photographs or pictures. Walter Gaston, a constable of the H Division of Police, said that at a quarter to one o'clock at noon on Friday, while on duty in the Whitechapel Road, he saw a large mob of persons assembled round the prisoner, who was selling photographs from a barrow. There being a great obstruction, witness requested the defendant to leave. He did so, but quickly returned and recommenced selling the photographs, which were of an indecent nature. The defendant was fined 20s. for the obstruction, and 40s. for exhibiting the photographs.

THE CENTENNIAL PHOTOGRAPH IN WINDSOR CASTLE.—In the *Ledger* of the 30th of November last we published a description of the great panoramic photograph, made by Mr. Gutokunst, of the Centennial Grounds, which carries the view from Agricultural Hall around the whole circuit of the buildings and grounds to the Observatory on George's Hill. The seven negatives for this were perfectly printed on a continuous sheet ten feet long and eighteen inches wide, an achievement unprecedented in photography, and requiring the highest degree of skill and care in the preparation of the sheet and in the manipulation of the negatives. A handsomely

mounted copy of this unique photograph was forwarded to the Queen of Great Britain by the hands of Col. Sanford, the British Centennial Commissioner; and that gentleman has forwarded to Mr. Gutkunst a letter from General Biddulph, one of the Queen's Secretaries, with "Her Majesty's acceptance" of the picture, and her thanks to Mr. Gutkunst. The photograph fully deserves this distinction, and Philadelphia may well be proud of it. It is to be placed in Windsor Castle.—*Public Ledger*.

TO ENAMEL PHOTOGRAPHS.—Take smooth glass; clean with rotten stone; polish with French chalk. With a small brush go round the edge to the depth of about a quarter of an inch with albumen diluted. Coat with collodion; dry. Take two tin dishes, fitting within each other, the outer to be filled with water, and kept warm with a spirit lamp. Put the warm gelatine in the inner one; immerse prints in. Well soak; take out each print; draw the back over the smooth edge of the dish. Lay on one of the plates, warmed slightly. Hold with the thumb and finger, and with a small squeegee rub lightly over. Let them become surface dry, and with glass put on the thin, damped backs of strong paper, and dry. Run a knife round the edge under the print to loosen from the albumen.—*Stationer*.

ANILINE WATER COLOURS.—Aniline water colours are extensively used for tinting photographs, and are also being introduced for painting water colour drawings. But as nearly all of these colours are altered by light, fade, and change, no honest artist will make use of them, unless he informs the purchaser by stamping some such notice as the following on the margin of the picture: "These colours, although pretty to look at, are good for nothing. They will soon fade."—*Scientific American*.

To Correspondents

R. D.—The proportion of pyroxyline depends much upon its quality. Some samples will make a thick glutinous collodion with three grains to the ounce, whilst others give a limpid collodion with ten grains or more. We prefer a sample of pyroxyline which gives a collodion of good working consistency with from four to six grains per ounce of solvents. As a general proportion for the salting, we like about four grains of iodide and one grain of bromide to the ounce of collodion. Take (say) two grains each of iodide of cadmium and iodide of ammonium and one grain of bromide of cadmium. Allow the collodion to stand a week after salting. This should then give good results, and improve steadily for some months. It will probably keep in good condition for a year or more. Simply iodized collodion will not keep so well. It is more troublesome to work, not readily giving such clean pictures, and is more suitable for pyro than for iron development. Altogether, we strongly recommend the use of bromide. Even a quarter of a grain of bromide to each ounce is a great improvement. 2. The preparation of pyroxyline is not difficult, but it requires care, and is occasionally not without some risk unless care be used. Take of nitric acid, sp. gr. 1.230, three ounces, and of sulphuric acid, sp. gr. 1.840, three ounces. Place these in a jar, and let this stand in a dish of hot water until the temperature of the acids is about 150° Fah. Now take two drachms of pure cotton-wool, pulled out into thin tufts, and immerse in the acids, pushing them down with a glass spatula, until the whole is immersed. Continue pushing down the cotton so as to keep it well immersed, and take care that every fibre comes into contact with the acids. Allow the immersion to continue for ten minutes. Then with a couple of glass spatulas lift the whole mass of cotton out, pressing it with the glass so as to squeeze out as much acid as possible. Then throw it into a basket of water, stir rapidly, and change the water. Continue stirring and changing until the cotton is well washed. Then pull out into thin tufts and place in a warm place to dry. The cotton will have gained from thirty to forty per cent. in weight, and should dissolve easily at the rate of five or six grains per ounce of equal portions of ether and alcohol, leaving very little residue. The chief danger arises from imperfect immersion of the cotton, or using too much cotton, which will occasion evolution of the acids, and giving off of nitrous fumes poisonous to inhale. The acids in each case spurt up sometimes on the operator's hands, producing serious wounds. It is best to wear india-rubber gloves with gauntlets to cover the wrists.

A. E.—So far as we can judge from the plans, your studio will answer well. It will not infringe Mr. Vanderweyde's patent; it trenches more nearly upon Mr. Slingby's design, but we do not think it will infringe his patent, so far as we can judge.

W. C. P. E.—A good quarter-plate or carte lens will answer your purpose best. A lens of long focus is not required for enlarging. Such a lens will also answer for lantern purposes.

B. C. BURY.—It will be quite possible to produce portraits in such a room as you describe, although, of course, it would be better if you had more light. But you will find that by the use of a white screen opposite the window you will get reflected light on the shadowed side of the sitter. It will be wise, also, to place the sitter in a position partially inclined towards the window; by this you will gain an advantage. The light through the glass door at the end of the room opposite the background will also tend to soften shadows. A sheet of tissue paper will modify direct sunshine, and render it useful.

G. M. R.—Fargler's original method (the first by which a carbon print was exposed on one side and developed on the other) was as follows:—A sensitive preparation of gelatine and bichromate of potash was spread on a glass plate, and allowed to dry. The plate was then placed under a negative, the coated side being in contact with the negative. After exposure the exposed film of gelatine was coated with tough plain collodion, and when dry immersed in warm water, this dissolved the under layer of bichromated gelatine, and the film floated off into the water, exposing the under side, the development with the warm water proceeding at that side opposite to that which was exposed and afterwards protected with collodion. The floating film had then to be lifted from the water and mounted. The especial point of Mr. Swan's process was providing a practical method of effecting the same purpose, which, it will be seen, was then difficult and uncertain.

G. WRIGHT.—Since answering you before, we have made enquiry, and find that the answer we gave is correct. You can make no conditions in enlisting; but, possessing a knowledge of photography, you would, on enlisting in the Engineers, be almost certainly placed in the photographic department.

STANISLAW LAWREN.—In reply to a correspondent recently enquiring where he might purchase lenses for a stereoscope, Messrs. Chancellor and Son, of Lower Backville Street, Dublin, write to say they can supply them.

W. ALAN ASHES, JO. VARRIE, and others, in our next. Several Correspondents in our next.

METEOROLOGICAL REPORT FOR MARCH.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Brompton, near Whitehall, 26 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE (IN DEGREES).			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	30.10	30.18	30.30	30°	30°	30°	Rain at night. Gloomy all day.
2	29.00	29.01	29.31	43	45.5	43	Rain morning and night. Foggy the rest of the day.
3	29.55	30.28	30.04	47	51.5	44	Foggy. A little rain morning and afternoon. (noon)
4	29.78	29.78	29.79	37	42	36	Fair, generally sunny.
5	29.80	29.63	29.07	36	40	41	Rain this afternoon and night.
6	—	—	29.73	—	—	34	A little sleet this afternoon.
7	29.82	29.85	29.04	30	30	34	Fair and sunny. (ing)
8	29.90	29.87	29.00	32	36.5	36	Snow a.m. Sleet afternoon. Rain evening.
9	29.78	29.78	29.30	34	42	39	Rain this afternoon and evening.
10	29.93	29.93	29.04	30	39.5	40	A few drops a.m. Continuous rain p.m.
11	29.50	29.48	29.43	44	44	40	Showers of rain, with wind, a.m. & p.m.
12	29.34	29.40	29.45	44	44	40	Showers a.m. and p.m.
13	29.16	29.46	29.20	43	44	40	Rain p.m. (afternoon)
14	29.22	29.24	29.31	39	39	35	Generally gloomy. Snow showers this
15	29.31	29.32	29.23	46	46	41	Fair, generally sunny.
16	29.33	29.37	29.40	46	44.5	43	Rain showers a.m. and p.m.
17	29.46	29.47	29.41	41	44	43	Fair and sunny.
18	29.33	29.37	29.30	41	44	44	Fair and sunny.
19	30.28	30.30	29.34	47	43	37.5	Fair, but cloudy.
20	30.48	30.55	29.59	34	41	34	Fair, generally sunny. (at night)
21	30.46	30.40	29.14	40	41	41	Rain early this morning. Very windy
22	30.02	30.00	29.00	38	40	41	Rain a.m. and p.m. Very windy.
23	29.82	29.82	29.31	45	47	44	Rain a.m. and p.m.
24	29.09	29.06	29.03	43	47	44	Rain p.m. (Thunder clouds)
25	29.07	29.10	29.17	44	43	44	Rain p.m. Very dark this afternoon.
26	29.41	29.43	29.03	44	43	40	Fair and sunny.
27	29.06	—	29.00	42	43	40.5	A few showers p.m. Heavy clouds
28	29.73	29.84	29.04	44	43	46	Fair, generally sunny.
29	29.61	29.80	29.20	44	49	45	Rain a.m. and p.m.

Summary.				Mornings. Noons. Nights.			
Highest temperature	...	...	...	— 47°	...	50°	46°
Lowest	ditto	...	...	— 30°	...	36.5	33
Mean	ditto	...	...	— 38°	...	44°	39.5
Mean of all observations	...	...	...	41°-3	...	...	...
Days on which rain fell	...	...	...	...	...	...	23
Fair days	...	...	...	...	...	...	9
Fair days bright	...	...	...	...	...	...	8
Fair days gloomy	...	...	...	...	...	...	1

The Photographic News, April 27, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A PERMANENT PHOTOGRAPHIC EXHIBITION IN LONDON—THE REPORT UPON THE TRANSIT OF VENUS OBSERVATIONS.—

A Permanent Photographic Exhibition in London.—The other day we overheard a gentleman remarking how strange it was there was no permanent photographic exhibition in London. He pointed out how attractive all shop windows were in which photographs were exhibited, and mentioned the names of some dealers before whose premises a crowd of spectators was always to be found. And really it does seem singular that no one should yet have deemed it worth while to establish such an affair. At the West End about this time, when "all the world and his wife" is in town, and exhibitions and galleries of all kinds are crowded from noon to evening, a photographic collection would find, we feel assured, a very large number of patrons. In the first place there are always a large number of idlers and saunterers at the West End who find it hard to get through the day, and who soon exhaust all the well known morning "shows" that are to be seen at this time of the year. Before lunch, or during that awkward period afterwards before it is time for the row, or for dinner, there is plenty of time to spare, and if a photographic exhibition were properly organized, it would be pretty certain to be a success. Of course it would have to be arranged in an attractive manner, with photographs of all kinds and descriptions, and for this reason one firm of photographers only should not be interested in the affair. Portraits and landscapes and *genre* pictures, all might be represented, and indeed a good plan would be to make a selection of the works at the ordinary autumn exhibition. Such a series, supplemented, perhaps, by a good collection of portraits of various sizes, representing past and present celebrities, would scarcely fail to prove attractive, and we do not hesitate to say, that supposing the exhibition were located in a good neighbourhood, near the Haymarket or Piccadilly, there would be no lack of visitors. Photographs of pictures should not be forgotten, and might be drawn not only from English schools, but from those of Paris, Berlin, Munich, &c., where such things are far more prolific than with us. No doubt, too, a good many sales would be effected, and in this way a larger income realised. While, on the one hand, it is very certain that the public like looking at photographs, and would not be deterred therefrom by an admission fee of sixpence or a shilling, it is equally apparent on the other that our photographers, and especially those who occupy themselves with the production of *genre* pictures and pictorial photographs, have but very limited opportunities for making the public acquainted with their work. Such men receive nowadays but very little encouragement, for, as a rule, very few copies are sold of a photographer's masterpiece. Witness H. P. Robinson's fine combination pictures, Earl's magnificent landscapes, Blanchard's studies, Rejlander's charming art sketches, to cite but a few instances at random; and yet the returns received by these gentlemen, though by no means insignificant, are sullied together inadequate. Mr. Hubbard's picture of "Stolen Moments," which received such unqualified praise, brought so little recompense for the trouble expended, as, we believe, to discourage the author against any further attempts in that direction. It is the same with the charming landscape enlargements that photographers themselves have often admired, but which do not find a sale among the general public, for the simple reason that the general public know nothing about them. No doubt the autumn exhibition of the Photographic Society has done much to make public many works which would otherwise never have reached the outside world, but an exhibition only opened for a limited season, and when town is empty, cannot further the object to any great extent. Now that carbon printing is so far advanced that we can

produce prints of large dimensions without difficulty, there is no reason at all why fine landscape productions should not take a place on the walls of our libraries and dining rooms, and replace the engravings of more or less value that usually adorn such apartments. It is not much of an engraving that sells for two or three guineas, and for this sum the finest photographs, printed in permanent pigments, can be secured. A two or three feet picture representing some bowery nook upon the placid Thames, or a well-chosen wood or lake scene—one, perhaps, with which the owner is familiar—is certain to prove far more attractive as a wall picture, than the engravings one usually sees hanging around. But there is, as we have said, little encouragement at present given to photographers for the production of such pictures, because there happens to be no mart in which they can be exhibited to the public. If this were in existence, matters would be changed; there would be a great demand for art pictures, and the securing of these would at once become a money-making occupation. There is no incentive like that of commerce, after all. Given purchases of an article, no matter whether this is the result of a man's hand or brain, and the quality and quantity of that article are at once improved. We feel sure it is due more to want of patronage than anything else on the part of the public that photographers do not produce more art pictures. A good illustration of this is shown by the incentive to literature and art which exists with us at the present moment. Neither Germany nor France, countries far larger and more populous than Great Britain, can show such a list of authors and essayists as we can, for the reason that our journals, magazines, novels and other works are more widely patronised, and sold in far larger numbers than abroad. For every writer who gets £500 for a novel on the Continent, there are probably twenty who do so in this country. It is the same in art matters, although the difference may not be so marked. Still, of the many pictures exhibited every year at the Royal Academy, it is seldom, we believe, that a fourth remains unsold at the conclusion, while many of the artists sell several copies besides the original. Such a state of things cannot fail to give encouragement to painters, and urge them to make progress in their profession, and, as a result, we may point to the many clever young artists who are now sustaining the reputation of the English school of painting. With photography it would be the same. If more patronage were given, we should have better work and more of it. But this patronage cannot be expected unless publicity is given to the pictures that are produced, and it is to this end that we have penned these words. The public naturally like photographs; it may be seen examining the works of the camera on every possible opportunity, its interest in the art being particularly marked. Let people have more chances still, we say, and the result will be highly beneficial to photographic progress, our brethren may rest assured.

The Transit of Venus Observations.—At last the House of Commons has become impatient upon the subject of the Transit of Venus observations. The other night Mr. Childers put a question regarding the publication of the results that had been arrived at, and the First Lord of the Admiralty, as representing the Astronomer-Royal, gave what information he could upon the subject. We are glad to know that there is a possibility soon of getting to know what our astronomers and photographers did on that eventful occasion. In six weeks' time, Mr. Hunt informs us, we may hope to have the declarations of Sir George Airy before us, although some mouths must elapse before the calculations based upon the photographic records can be completed. We presume it is the intention of the Government to illustrate their report by means of some of the photographs taken, for the details would be hardly complete without such addenda. It is some consolation to know that the end of the work is approaching, for this is the first intimation we have received of such being the case.

OXYGEN-PRODUCING APPARATUS.

BY M. NOTON.*

THE next point was to find out whether a low temperature would drive off any oxygen. I expected it would, as I had frequently smelled something when drying the plugs in the oven. A plug weighing 686 grains was put into one of the old retorts, a bent copper pipe screwed into the union, and the other end connected to the small washing bottle. This at the outlet was connected to a tube for delivering the gas under water into an inverted bottle full of water. The retort was put overhead in water in a can; the temperature was gradually raised to the boiling point, but not a bubble was obtained. Tablespoonsful of salt were added at intervals, and the temperature of the solution noted till there was a boiling saturated solution; not a bubble appeared. The boiling was stopped, the retort taken out, allowed to dry and cool a little, when I found the pipe screwed into union was slack, but not so slack but that if there had been a fair evolution of gas there would have been some bubbles. The plug was taken out, and found to have lost in weight six grains. It had not changed its appearance at all, and there were no alteration in bulk. The plug was then cooked in the new machine, and gave 602 cubic inches of oxygen, being at the rate of 4.74 cubic feet per pound of chlorate. It fastened to the bottom of the retort tube as usual, or worse, as it was clean.

The next day I made another trial, leaving out the washing bottle, and carrying a continuous pipe from the top of the retort to the neck of the inverted water bottle. A plug weighing 696 grains was subjected to the heat of the salt water, as before. Very small bubbles, about one a minute, passed up into the bottle as the temperature rose; the boiling was continued for half-an-hour, and then stopped. I had about one cubic inch of bubbles in the bottle which did not stimulate the red-hot end of a bit of lighted stick just blown out, so I concluded that it was simply expanded air from the retort. The plug was turned out, and found to have lost four and a-half grains only. It was quite unaltered in appearance or bulk. I have thus got at this fact—that a dry plug is not decomposed by a heat of fifteen degrees above boiling water.

Then comes another question:—Will a wet plug give off any gas? And then, another:—What is really the temperature when full decomposition begins? These questions must stand over for the present. I am glad I have solved one.

Returning now to the machine. Knowing that a draw-

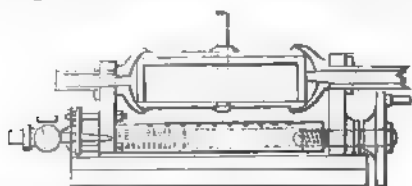


Fig. 1.

ing goes further in giving an idea of a thing than mere words, I have made an elevation (fig. 1), a plan (fig. 2), a

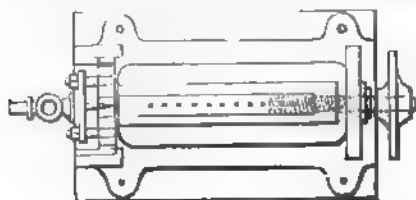


Fig. 2.

left-hand end view (fig. 3), a right-hand ditto (fig. 4), and a photograph (fig. 5) of the machine itself, now on the

table. In the elevation, a plug, four and a-half inches long by one inch diameter, is represented as in a retort tube, five inches long by one and a-quarter inch bore. The ends of the retort tube are convex, and a handle midway is provided for. Each of the concave cups is shown with an out-

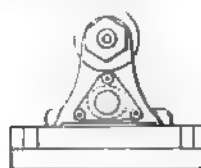


Fig. 3.

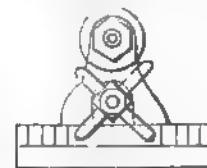


Fig. 4.

let, but one will be sufficient. That the part of the "vice" which is usually the screw box is here made into an aerated gas burner as well, the gas and air going in at the left-hand end, the drawing-up screw working in the right-hand one.

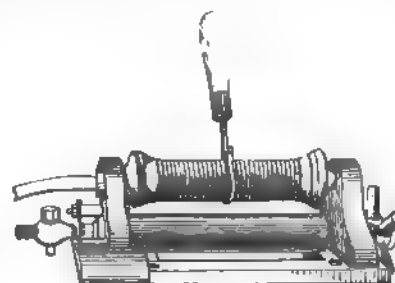


Fig. 5.

The machine may, or may not, be permanently connected to the gas-holder; in the latter case it may, like Mr. Chadwick's, be placed nearly anywhere, only requiring a flexible tube to first connect it to the washing bottle, and from there to the top of the gas-holder.

REMARKS ON STUDIO WORK.

BY A. SACHS.*

In submitting the following remarks to your attention I trust you will excuse anything in them which may not be in accordance with your own views or theories.

We are all pretty well aware that our art is denied a place as one of the fine arts. May I ask, why is this so? Photographs can and are being daily produced which, for truthfulness, delicacy, posing, and lighting, far surpass many of the so-called works of art, with the exception that they are wanting in that great charm of all pictures, namely, colour. Photography in natural colours is of so complicated a nature that it must certainly be some years to come before it is made practicable, although I have a firm opinion that it will come to pass eventually.

But, apart from the want of colour, there is also another very great cause of our being denied admittance within the bar, and that is that the really artistic part of photography has been too much overlooked in the great desire to obtain clear, sharp photographs with plenty of definition—a quality to be admired in any picture when the adjunct, light, has been properly used. If that be neglected the results are far from satisfactory, being stiff and unnatural both in expression and lighting, and is a very just reason for refusing to recognize photographs to be considered as art-productions. Look at the works of our acknowledged leading men, and ask yourselves, are they made at random or mechanically? No; they are the results of care and experience combined with an artistic eye and taste. It is out of the question for any person to

* Continued from page 184

* Read before the West Riding of Yorkshire Photographic Society.

produce a good photograph unless he perfectly understands, and is capable of using and controlling, his light.

The subject of light and lighting pictures can never be exhausted; but, as a passing remark, I would advise all, when they see any work or photograph worthy of a place in their album as a study, to obtain it if possible, and do their best to produce results as good, or, if possible, better. There is no harm done in imitating a good thing, and it will in the future elevate our art to the front rank.

A school of photography, for the purpose of teaching and training, would, in my opinion, be a great step towards its ultimate recognition.

As to the chemical part of photography; whilst it is essential that everything should be in good order and harmonize with each other, this department is much more mechanical than the lighting of a picture. A properly-posed and lighted photograph is charming, even if the negative, chemically speaking, be not perfect; but when all are in unison we can look with satisfaction on the result of our labours.

There are so many good formulae published that I think it would be out of place to particularize any of them; they are all, or nearly all, workable, and with care and attention give good results. If you think my own formulae would be useful, here they are, although I must say that they are about the same as nearly all use.

Silver Bath.—Thirty grains in summer; thirty-five grains in winter—very slightly acid.

Developer.—Protosulphate of iron ... 3 ounces
Glacial acetic acid ... 3
Water ... 90 "
Alcohol ... 8 to 4 "

If the developer require more than that quantity of alcohol to flow freely, there is too much ether and alcohol in the silver bath, which should be boiled in order to evaporate it. I always keep a Winchester bottle of developer in hand to age slightly before use, as in practice I find it gives cleaner pictures without any loss of power.

Intensifier.—Pyrogallie acid for intensifying I have not used for a very long time, and can recommend the formula given by Mr. V. Blanchard, three or four years ago, as follows:—

Saturated solution of iron ... 2 ounces
Glacial acetic acid ... 1 ounce
Citric acid ... 1 "
Water ... 20 ounces

to which add the silver as required.

Use cyanide for fixing, as quicker and cleaner.

PRINTING PROCESSES.

There is just now an animated discussion going on about the relative value of the two printing processes—silver and carbon—for which I must refer you to the journals; but as a carbon worker I can fully endorse all that has been said in favour of that process, as to its simplicity and also as to its commercial value. Whilst fully recognizing the merits of silver printing, I firmly believe that the sooner it gives place to its rival the better stand photography will be able to take in the arts—as permanency, without doubt, is a very great advantage, telling well with the public, and at the same time gaining both honour and profit.

DRY PLATES AS SENSITIVE AS WET ONES.

BY ERNEST BOIVIN.*

THE cleaning of the glass plates should be undertaken in the first place with soda or potash, and after several rinsings in water they are rubbed with whitening, by means of a rag or tuft of cotton wool. The sensitiveness of my plates when in a dry state depends upon this alkaline

* This paper, read before the French Photographic Society, was quoted some weeks back by our Paris Correspondent; we now give it in its entirety.—Ed. P. N.

cleaning, in the same way as the success of wet collodion plates in great measure comes from a preliminary clearing of an acid character. This operation may be carried out some time previously, and then, when the plates are required for use, there is nothing to be done beyond removing the deposit of chalk with a bit of flannel, which is only employed for the purpose, and pass over the surface a camel's hair brush. Then the plates are ready to receive the preliminary albumen coating, which consists of

Albumen (one white of egg) 30 cub. cents.
Water ... 70 "
Ammonia ... 1 to 2 "

This is beaten to a froth, and then allowed to subside.

After the surface of the plates has dried again, they may be put away in a grooved box for use when convenient.

In collodionising the glass plates I prefer to use a ripe material, or, at any rate, a mixture of two-thirds new collodion and one-third old. The sensitizing takes place in a bath prepared of:

Water ... 100 cub. cents.
Nitrate of silver ... 8 grammes
Acetate of lead ... 1 gramme
Glacial acetic acid ... a few drops

It is most advantageous, I find, to expose the sensitizing bath to full sunlight for some time, and then filter it before employment; in this way it is possible to prevent any fogging or abnormal signs of development, which is a very frequent source of non-success in dry plate work.

After sensitizing, which requires something like three minutes, I proceed to wash my plates, first of all with water slightly acidified with acetic acid, and then with pure rain-water. I then cover the sensitive film—1, with a three per cent. solution of phosphate of soda; 2, with a one per cent. solution of gallic acid; then, without washing, the undermentioned preservative varnish is applied:—

Water ... 100 cub. cents.
Pure dextrine ... 9 grammes
Gum-arabic ... 1 gramme

This varnish is prepared warm, and, after the addition of a few drops of acetic acid, it is filtered through paper.

The plates thus coated are put into a drying cupboard, so that they may be uniformly and perfectly dried, and, thus prepared, will maintain their high sensitiveness for a fortnight or so. The preservative varnish itself will keep good a long time without decomposing or deteriorating, especially if maintained at an even temperature in a cool locality.

The duration of exposure varies according to the lens employed. For instance, with a quarter-plate landscape lens, an exposure of from ten seconds to one minute suffices with a diaphragm of a centimetre.

As regards the development of the image, I proceed as follows. I immerse the exposed plate in very pure water, and then pass it into another bath containing tepid water. I wash the plate for the last time, and then submit it to the action of the undermentioned developer:—

Water ... 250 cub. cents.
Gallic acid ... 1 gramme
Pyrogallie acid ... 0.3 grammes
Acetic acid ... 3 cub. cents.
Alcohol ... 3 "

Into this developer is put, the moment that the plate is immersed, some drops of a three per cent. solution of phosphate of soda, a few drops of acetate of lead of the same strength, and a little acetic acid. At the end of a few minutes the plate is taken out of the bath again, and a trace of a solution of silver (3 per cent. strength) is added to the liquid. The plate replaced in this energetic reducing liquid speedily brings forth an image in all its details, and then more silver solution may be added if it is desired to add to the vigour of the cliché.

The intensifying of the plate is undertaken in the ordi-

nary way, and the fixing is carried out with a solution of hyposulphite of soda of twenty per cent. strength. The plate is, of course, allowed to dry before it is varnished.

I may, perhaps, be permitted to say a few words upon the theory of the process which has enabled me to obtain such charming clichés of trees and foliage this summer. The albumen I employ to impart to a sensitive film an organic matter susceptible of absorbing the iodine set at liberty by the action of the light, and at the same time, to render the collodion adherent to the glass plate.

The acetate of lead in the silver bath acts in the same way as acetic acid to prevent fogging, but with the difference that the former does not exert a retarding action. By permitting the light to act upon the sensitizing bath, I am enabled to reduce the organic matters which, separated by filtration, are no longer the cause of spots and pinholes that so frequently trouble dry plate workers.

The phosphate of soda I use after sensitizing has the effect of transforming into phosphate of silver, which is very sensitive to light, the last traces of nitrate of silver remaining upon the film after washing; the latter if permitted to remain, would alter the sensitive film in a very little while. Gallic acid is the principal agent that I employ; it acts at one and at the same time as sensitizer and preserver of sensitiveness.

The preservative varnish serves to protect the iodide of silver in the film from contact with the air; it absorbs, like the albumen, the iodine freed during the exposure of the plate, and, at the same time, prevents the collodion from changing its molecular state during its desiccation in the drying chamber. The varnish after application is very easy to remove, and is at once taken from the plate by washing, especially if warm water is used for the purpose. Thus it allows the reducing or developing agent to act with all its power upon the exposed sensitive film.

The phosphate of soda and acetate of lead added to the reducing liquid augments the power of the developer something like fifty times, and, moreover, they have the effect of producing that intense brownish-green deposit which is so valuable in the production of vigorous prints.

CARBON PHOTOGRAPHY.

PROCESSES WORKED AND PERFECTED BY A. BRAUN & Co.*

3. *Direct and Temporary Transfer.*—We have seen that the adherence consists in the transfer of the impressioned pellicle on a support, final or temporary as the case may be.

A thick glass plate is made use of, which is placed horizontally between two dishes filled with cold water.

In one of the dishes the transfer paper is soaked for a few minutes. Then the impressioned image is immersed in the other dish, and allowed to remain until it becomes a little soft. Withdrawn from the water, the print is then placed on the horizontal glass, the prepared surface of the new support in contact with the surface of the image. The squeegee is passed over the back of one of the two papers, so as to make a perfect adherence, and the print is set on one side. Five or six minutes after the adherence these prints may be developed. Those that have been placed upon a rigid surface—diapositive glass, for example—should be allowed to remain for at least half an hour before being developed. The rigid surface receiving the print should be properly cleaned, without any other preparation. The water used in these operations should be as clean and pure as possible, and should not exceed 10° Cent. (50° F.). This operation should be performed in rather a cool place.

4. *Washing.*—The impressioned print, together with its support, is immersed in a bath of hot water at from 40° to 50° Centigrade (104° to 122° Fahr.). In a few moments the coating of gelatine that has remained soluble is dissolved, the first support detaches itself, leaving the image adhering to the second support, the image appearing gradually as the soluble portions of the gelatine separate

from the insoluble ones. When the print has parted with all the gelatine that has not been impressioned, it is withdrawn and placed in cold water. If the image is over-exposed, the washing is prolonged in hot water. After withdrawal from the cold water, it is well to immerse it in a solution of 1,000 parts water and 50 parts of alum, and dry immediately.

When the print has been made with a reversed cliché, and transferred to its final support, it is completely finished. This final support is not the same for direct prints and for those which require a double transfer. The reader will find further on a list of the different kinds.

For this purpose is used a glass plate placed horizontally

5. *Final Transfer.*—The print made with an ordinary cliché should be placed on a new support, to regain its true position, on two dishes, as in Chapter 3; one of these dishes contains hot water, the other cold water. The print to be transferred is soaked for a few minutes in the cold water. The final sheet is placed in the hot water and allowed to remain in until the gelatine which forms the surface commences to become slightly swollen and soft. It is then withdrawn and adjusted on the print, which has been placed on the plate, the two prepared surfaces in contact. The squeegee is passed over the back of the final paper, so as to make thorough adherence, and then allowed to dry. Avoid rapid drying of prints on caoutchouc.

After being well dried, if the print is upon waxed paper, it will leave its temporary support very readily; it suffices to raise this support by one of the corners. If, on the contrary, the print is placed on caoutchouc, the back of the support is rubbed with a small sponge soaked in benzine, and a few minutes afterwards remove as before.

All these manipulations require great care and cleanliness.

6. *Varnishing.*—When necessary we use to varnish our prints a special varnish which we can furnish to our customers. A squeegee of velvet made expressly for this purpose is soaked in the varnish, and passed very uniformly over the surface of the print, which is dried rapidly over a small gas stove. Before varnishing the prints must be first retouched.

Reversed Cliches.—We have shown the advantages, in carbon printing, of the use of reversed clichés. We will now give the mode of operating.

The cliché is made according to the methods peculiar to each atelier; it is kept a little weaker than is required, as the gelatine will have the property of slightly strengthening it. We have found that strong clichés give better results than weak ones.

The cliché is dried, and then immersed in a solution of

Water	...	...	...	1000 parts
Hydrochloric acid	...	...	...	20 "

In which it is allowed to remain until the edges commence to rise.

It is then washed with care, and dried.

The cliché is now placed on a level tripod standing in a dish destined to receive the excess of the following well-filtered solution:—

Gelatine	...	...	...	50 parts
Water	...	...	...	600 "
Glycerine	...	...	...	5 "

Which is poured upon the negative image, avoiding the formation of air-bubbles.

When the gelatine is coagulated the cliché is allowed to dry spontaneously, and is collodionized with normal collodion.

Ether	...	...	100 c. c. = 3½ fl. ounces
Alcohol	...	...	100 c. c. = 3½ fl. ounces
Gun-cotton	...	...	2 grammes (31 grains)

This last coating when dry is cut on the edges with a knife, and the cliché leaves the plate very readily. The negative forms thus a pellicle which is easily kept in a book.

If it is desired to replace this cliché on glass, it is useless to collodionize it after having covered it with gelatine. In this case it is placed on a perfectly clean plate covered with

a coating of gelatine containing alum. The adherence is obtained by the use of a very soft squeegee in the identical manner employed to fix a carbon print on glass.

It is well to affix on the edges strips of black paper, placed half on the glass and half on the pellicle, so as to prevent any ulterior detachment. These strips serve also as opaque borders in the printing.

The Photometer.—The photometer that we make for the use of our customers consists of a little box, the glass lid of which is furnished with a series of nine tints increasing gradually in intensity. In the centre of each of these tints is a small space completely opaque. A strip of sensitized paper is placed behind this scale of tints, and the photometer exposed to light. As soon as the tinted divisions become impressed, the opaque space will appear in white on the sensitized sheet, and opposite a number which serves to indicate a tint corresponding to the more or less vigorous appearance of a cliché.

The strip of sensitive paper is placed on a movable board, covered with osontobous impregnated with a little benzine, so as to retain the paper.

For sensitive paper we make use of the back of our sensitized pigment paper.

Before commencing regularly the printing it is well to develop a first print which, by the aid of the photometer, will determine exactly the time of exposure according to the sensitiveness of the paper.

We should remark that in developing the prints a certain time after their printing, they become stronger, and consequently should be printed a little weaker than if they are developed when just coming from the frame.

Our photometer is so easily used that we have no hesitation in recommending it to our customers.

We have given as simply and as clearly as possible the different operations of a process used daily in our ateliers by nearly one hundred employés. If we insist on the importance of our work, it is in the hope that the public will see in it an important guarantee of the correctness of the information contained in this treatise, and which is the result of observations and improvements made during a number of years.

We have not paid much attention to the careful style of our language. In offering this treatise to operators we hope that it will be useful to them in their first serious experiments with carbon photography. Moreover, we place ourselves at the disposal of our customers who might wish to see in our ateliers the different manipulations as we practise them there.

METEOROLOGICAL SUMMARY, 1876.

TAKEN FROM THE REGISTER OF W. H. WATSON, F.C.S., F.M.S.—The monthly highest, lowest, and mean temperatures observed at Braystones, near Whitehaven, during the year ending December 31st, 1876, have been as follows:—

1876.	Highest.			Lowest.			Mean.			Of all Observations.
	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.	
January ...	47°	50°	49°	31°	31°	22°	37° 5'	40° 8'	38° 0'	38° 7'
February ...	48°	54°	50°	32°	33°	24°	38° 0'	43° 4'	40° 4'	40° 8'
March ...	50°	54°	50°	26° 5'	38°	29° 5'	39° 0'	43° 8'	39° 2'	40° 8'
April ...	53°	61°	58°	32°	40°	32°	44° 0'	51° 8'	44° 5'	48° 8'
May ...	58°	65°	63°	41°	46°	39°	45° 0'	56° 1'	48° 0'	49° 7'
June ...	75°	82°	71°	50°	57°	48°	57° 9'	64° 4'	55° 3'	59° 2'
July ...	74°	79°	69°	54°	58°	54°	61° 6'	67° 3'	59° 5'	62° 9'
August ...	78°	82°	74°	52°	54°	46°	62° 1'	66° 0'	55° 4'	62° 3'
September ...	59°	69°	67°	48°	52°	48°	53° 1'	61° 5'	49° 9'	51° 8'
October ...	60°	65°	61°	51°	40°	53°	61° 2'	55° 8'	51° 7'	52° 8'
November ...	52°	55°	54°	38°	35°	33°	43° 0'	45° 7'	42° 5'	43° 4'
December ...	53°	58°	49° 5'	28°	32°	29°	43° 5'	46° 0'	43° 4'	44° 0'
In the year...	76	82	74	33	30	22	—	—	—	—

The highest and lowest readings of the barometer (thirty-six feet above sea level) were as follows:—

1876.	Highest.	Lowest.	Day on which the highest was observed.	Day on which the lowest was observed.
January ...	30.45	29.32	15th	20th & 21st
February ...	29.95	28.93	7th	18th
March ...	29.80	28.20	18th	8th
April ...	30.20	28.62	5th	19th
May ...	30.20	29.37	8th	22nd
June ...	30.08	29.35	27th	5th
July ...	30.20	29.40	15th	7th & 8th
August ...	30.16	28.92	11th	31st
September ...	30.10	29.18	20th	5th & 6th
October ...	30.14	28.79	31st	11th
November ...	30.20	29.15	1st	16th
December ...	29.97	28.26	9th	4th
In the Year ...	30.45	28.20	January 15.	February 6.

The following table gives the number of fair days, number of days on which rain fell, number of fair days bright, and number of fair days gloomy:—

1876.	Fair Days.	Days on which Rain fell.	Fair Days Bright.	Fair Days Gloomy.
January ...	14	17	3	11
February ...	5	24	3	2
March ...	12	19	5	7
April ...	14	16	7	7
May ...	23	8	7	6
June ...	20	10	15	5
July ...	22	9	18	4
August ...	17	14	13	4
September ...	16	14	10	6
October ...	18	18	7	6
November ...	18	12	11	7
December ...	6	25	2	4
In the Year ...	180	186	111	69

The monthly mean temperatures of the year 1876 compared with those of the previous year furnish the following numbers; the mark + of course expressing so many degrees higher than in 1875, the mark — expressing so many degrees less:—

1876.	Mornings.	Noons.	Nights.
January ...	5.1° —	3.9° —	4.2° —
February ...	2.6 +	2.8 +	3.4 +
March ...	0.3 —	1.2 —	0.6 +
April ...	3.4 —	0.2 —	0.5 —
May ...	6.4 —	0.3 —	8.1 —
June ...	1.4 +	2.9 +	0.1 —
July ...	3.9 +	3.3 +	2.2 +
August ...	2.3 +	1.4 +	1.9 —
September ...	3.9 —	0.5 +	6.5 —
October ...	4.8 +	4.8 +	8.0 +
November ...	2.4 +	2.7 +	3.3 +
December ...	2.9 +	3.9 +	8.1 +

Comparing the number of fair days in the year 1876 with the number of days on which rain fell, we find the days on which rain fell exceeded the fair days by six, while the fair days bright exceeded the fair days gloomy by forty-two. The fair days in 1876, compared with those in 1875, show a difference of three,—more in the former (1876). Further comparisons may be made by referring to the summaries for 1874 and 1875. PHOTOGRAPHIC NEWS, vols. xix. and xx., pages 93 and 161.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday, May 3rd, in the rooms of the Society of Arts, John Street, Adelphi, a paper on "Photographic Difficulties" will be read by Mr. F. York.

The Photographic News.

Vol XXI No 973.—APRIL 27, 1877.

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HEATED AIR INSTEAD OF OXYGEN IN THE LIME LIGHT.

MEANS of producing artificial light of good actinic quality at a moderate cost, without risk of explosion or other danger, must always interest photographers, and many and various experiments made from time to time have been brought under the attention of our readers. The oxyhydrogen light has of course satisfied the condition of efficiency; but besides the cost of oxygen there has been the greater objection of risk in its preparation, storage, and use. Mr. Woodbury has recently been good enough to bring under our attention the result of some experiments, by which he hopes to obtain a light, in all respects efficient for lantern purposes and for enlargement, in which, whilst obtaining the brilliancy and the purity of incandescent lime, he dispenses entirely with oxygen in obtaining it.

Mr. Woodbury does not claim to have invented a new thing, but he has made a valuable application of an existing thing. Some of our readers may be familiar with the Fletcher blow-pipe, in which a jet of heated air, inside a gas jet, emerges at the same orifice as the gas, into the flame of which it enters, producing an intensely hot concentrated flame. This constitutes the Fletcher blow-pipe. The air-pipe is connected with an air-bag, sending a stream of air through it, finally entering a spiral tube, which twines round the gas-burner, both being heated by a Bunsen burner underneath. The intense jet to which we have referred is made by Mr. Woodbury to play upon a lime cylinder, by which is produced a concentrated flame of very intense brilliancy and pure actinic colour, admirably suited alike for the sciopicon or other magic lantern, and for photographic enlarging purposes.

The apparatus is neither complicated nor costly, and there is no complexity or difficulty in the working. The one point which Mr. Woodbury is still anxious to improve is the lime cylinders, which have the usual tendency to crack, and eventually fall into pieces. He is experimenting to secure some improvement here, and should he succeed we shall bring the matter again under the attention of our readers. In the meantime, the gain in simplicity, cheapness, and absence of danger is sufficient to recommend the improvement to all interested in the use of such lights.

FRENCH CORRESPONDENCE.

RECTIFICATION.—A CAUTION TO WORKERS OF EMULSION—DETONATION OF EMULSION COLLIDION—M. JANSSEN'S SUN RECORDS—IMPORTANT RESULTS—PHOTOGRAPHY AND THE PREFECTURE OF POLICE—SOCIAL GATHERINGS—THE VANDERWEYDE ILLUMINATING METHOD, AND THE NEW ELECTRIC LIGHT.

I WOULD ask permission in the first place to repair an error which slipped in my last letter. In giving the for-

mula for the collodion employed by M. Boivin, I wrote water for ether, which makes the collodion a very fantastic novelty. The formula should stand:—

Ether...	...	60 cub. cents.
Alcohol...	...	40 to 50 "
Pyroxiline (friable)...	...	1.50 grammes
Prepared at a high temperature.		
Bromide of zinc or ammonium	...	1.50 grammes
Bromide of uranium	...	1.50 "
Chloride of barium...	...	1.50 "

I said that after having coated the plate with the emulsion collodion, the latter is covered with a preservative, to render the films capable of use as dry plates. Of the many preservatives that may be employed for the purpose, M. Boivin has chosen one which not only gives good results, but which is also far from costly. Its basis is emetine, and may be easily obtained by boiling some ipecacuanha root in distilled water. A porcelain utensil is employed for the purpose, and five grammes of the root suffice for one hundred grammes of water. The roots are first of all reduced to powder. The liquid thus obtained contains emetine, sugar gum, gallic acid, and a resinous substance, which is precipitated by cold, and remains attached to the paper on filtering. The preservative, which will keep good for a fortnight, is equally good for application to emulsion collodion as to simple bromized collodion.

M. Boivin has discovered, by accident, a singular property which the emulsion collodion that he makes use of possesses. To study the structure of the impressioned film and the vascular tissue that is formed, he placed a film close to a lighted lamp, in order to examine the former particularly. Unfortunately, he approached the film too closely, and produced an explosion, to the great astonishment of the investigator; the film disappeared from the plate entirely, the latter being highly charged with electricity. The explosion had the same sound and intensity as the explosion of a small percussion cap, and was accompanied by a flash like that of an electric flash.

M. Boivin, to continue the experiment, at once detached some fragments of dry emulsion collodion from a plate, and approached them to the lamp. Another explosion, accompanied by a second vivid flash, was the result. My friend proposes to still further investigate the matter, so as to arrive at the rights of this singular phenomenon.

M. Janssen, at the last meeting of the Academy of Sciences, exhibited two photographs of the sun, obtained at the observatory at Meudon, which were peculiarly interesting. The pictures showed that a very important spot of some kind had suddenly formed upon the sun on the 14th and 15th April. An image taken at eight o'clock in the morning on the 14th inst. (with the instruments of which I have spoken in a former letter) showed the sun's disk perfectly free from spots, and as the diameter of the picture measures 30 centimetres, and the granulations on the surface are very clear, there is clear proof that the solar hemisphere, then turned towards the earth, was at that moment quite free from spots. But in the cliché executed on the day following—that is to say on Sunday, the 15th April—at the same hour, there was to be seen in the southern hemisphere, near the line of the poles, and close to the centre of the solar disk, a patch 2 centimetres in diameter covered with spots. The biggest of them presented a size varying from 15 to 20 millimetres, with the penumbra of figures in a very disturbed condition.

Now, what is curious about the matter is, that we are now at the time of the year which corresponds to a minimum of solar spots, and this epoch is attributed to a repose of the photosphere. But since M. Janssen has been engaged in making a daily photograph of the sun he has been in a position to observe that minor spots are produced, which, however, rapidly disappear. M. Janssen was desirous of securing upon the following days a series of views of the phenomenon which would have permitted him to follow its course until its disappearance. Unfortu-

nately the very bad weather interrupted his observations. In any case this example of solar photography has shown how right the eminent astronomer is in the course he has taken in insisting upon the utility of having recourse to photography, and getting the art to assist in securing records, the value of which can hardly be exaggerated.

Some very curious experiments have been made this week, by the photographic staff of the Prefecture of Police, respecting which I have several times spoken in the columns of the PHOTOGRAPHIC NEWS. The trials were in reference to a system of telegraph apparatus which permits of instantaneous transmission to a distance of portraits of any individual who may be wanted by the police. A sketch, made either from life or from a photograph, which has been procured, may be transmitted anywhere by the wires. It seems that the experiments, so far, have been very satisfactory, and I shall return to the subject shortly and supply my readers with details.

Another dinner has taken place among photographers concerned in the *Chambre Syndicale* of photography in Paris, at the Palais Royal. Subjects of professional interest were discussed during the fraternal gathering, and various projects were mentioned having for their object the drawing together of photographers more frequently. Another reunion is shortly to take place, but this time on a more extended scale, and I am glad to say under the roof of your humble servant. I shall have great pleasure in giving the readers of the PHOTOGRAPHIC NEWS an account of the affair.

During a visit which he was so good as to pay me, M. Vander Weyde explained to me the system of lighting studios which he has elaborated, and which has been spoken of in this journal some time ago. Some public trials are being made in Paris of a new description of electric apparatus, and M. Vander Weyde believes it possible by the aid of this to perfect his invention. I allude to the electric candles of MM. Denayrouse et Jablochkoff. The trials of these have been crowned with the complete success. At this moment the Grand Magasins du Louvre are lighted up by this invention. MM. Denayrouse et Jablochkoff pass an electric current through a plate of kaolin containing in the path of the fluid a conducting matter, which, on being consumed, heats the plate to such a degree that it becomes incandescent, and becomes in this way a conductor itself. It emits a most intense light, one, too, which is perfectly stable. As the kaolin is not consumed, the light is not interrupted. Such is the candle in question, but this is not all. The electricity may be disposed in such a way as to pass to a number of branches, and in this way the light can be distributed throughout a town, and this lighted up in the same way as gas is distributed nowadays.

It seems to me that the invention may well be combined with M. Vander Weyde's system of lighting, for the benefit of photographic studios.

ERNEST LACAN.

SIMPLIFICATION OF THE CARBON PROCESS.

BY H. BADEN PRITCHARD, F.C.S.

I AM induced to send you a few words upon the subject of carbon printing, for the simple reason that some gentlemen, who recently honoured me with a visit of inspection here, believe that the *modus operandi* I am employing for portraiture has something to recommend it. It is, however, very likely not new, or may, for aught I know, have something in common with Lambertype, Chromotype, Sawyer-type, &c., of all of which processes I am profoundly ignorant.

Wax and collodion are universally employed, I believe, in carbon printing, but some people use them one way and some another. Instead of waxing plates and then collodioning them, I find it simpler to do no more than apply wax, so far as the glass plates are concerned. After my tissue is printed, and before dipping each piece into cold

water (prior to development), I fix it upon a flat piece of wood, and apply a collodion film. A simple wood frame, like that of a slate, but having rubber fitted round the margin, is doubled over the board to keep the tissue in position, and prevent the collodion touching the extreme edges of the tissue. The thumb keeps the frame pressed against the tissue till the surplus collodion is poured off. As soon as the collodion is set the tissue is put into water; the greasiness of the collodion surface is washed off while the tissue soaks, and I then apply the print to the waxed plate, and develop in the ordinary manner.

A more even expansion of the gelatine is thus ensured, and there is no risk of losing any of the delicate portions of the picture. The tedious operation of collodionizing and washing a whole series of glass plates is avoided, and the coating of the pieces of tissue just before development is very easily and rapidly accomplished.

While on the subject I would point out to your readers the importance of distinguishing the phenomena of reticulation and insolubility, now that the warm weather is coming on; the former is to be subdued in a very great measure, the latter cannot under any circumstances be remedied.

War Department, Woolwich, 10th April.

BACKGROUND PAINTING.

BY NELSON K. CHERRILL.

I HAVE tried a plan of mixing the colours for background painting which has succeeded so very perfectly, and is at the same so exceedingly simple in practice, that a note of it may prove of some value.

I used Vandyke brown as the dark colour in preference to lampblack, and common whiting with the white. The Vandyke brown I purchased in a tin "ground in water." Large quantities of it in this form are sent out to these colonies, where it is used chiefly in making a stain for the interior woodwork of the houses. The tin being opened, the colour is as stiff and solid as cheese, and can be cut out with a strong knife. I cut out a lump of this colour and place it on a slab of glass, practically on a fifteen by twelve plate laid on the bench. Along with the colour I place a handful of whiting, and then add a little water. I now mix the white and brown together, using the flat side of a large chisel as a spatula. The mixing requires to be very thoroughly done, and is best if done in detail, i.e., a very little at a time. The tin colours being mixed (water enough being added to bring the mixture to the consistency of thick cream), they are placed in a bason, and the operation is repeated, using, as near as may be, the same proportions of brown and white. When the bason is full, the "tints" for the background may be made up. I take that which is in the bason for the darkest tint, and dilute some with more white for the lighter; for the actual lightest tints pure white may be used, as by the method to be described it will not come out white in the result. To make the colour so prepared stick, I use starch, which I find has every useful quality. I use three or four large, i.e. piled-up, tablespoonsful to a pint of water, mixed cold, and then well boiled up. When well set, I add another pint of water, cold this time, stirring briskly all the time. About one part of this starch mixture to three or four of the colour mixture forms the consistency of the paint; it may be, however, thickened or thinned within very considerable limits without detriment. I have not as yet tried how little starch will do, but it is a very small proportion, much less than might have been imagined.

To apply this colour to the background, if it necessary first of all to wet the canvas all over; this is best done with a wide plasterer's brush; when the canvas is quite saturated the painting may be begun. I prefer laying the darks on first, slushing the colour on broadly and thick with a wide brush; the canvas being wet, the paint goes on with an admirable smoothness from the first. When the darkest parts are in, put the next in order, and so on till

the very lights, which may be, as before mentioned, done with quite white colour. When the whole canvas is laid with the colour, it is ready for *brushing*, which is an important part of the process, as by it the tints are so perfectly bleended one into another that the effect when finished is as smooth and soft as can be imagined. A large, stiff clothes brush, fixed crossways on the end of a long handle like a garden rake, is the best form of brushing apparatus. The newly-painted background may be attacked with a weapon such as this, and vigorously brushed in all directions, due regard being had to the effect desired. When dry, the background will have a pleasant, warm colour, far preferable, in my opinion, to the cold grey obtained by the use of lampblack or "drop black" such as is commonly recommended.

The directions given above refer to the production of merely "*gradated*" backgrounds, but the same principles may be adopted to more elaborate works. The colour does not dry on the canvas, even in very hot weather, in less than two or three hours, so that ample time is given to put in quite an elaborate design if such should be required. Moreover this process has a very great advantage in one respect, namely, the work when dry can be touched and retouched as many times as needful without trouble, and the colour used in these retouches will dry on the old, and come to its proper shade without any trouble, and without so far as my experience goes, any danger of the edges of the new touches showing stains or joining marks. To retouch the background slightly, it is not necessary to wet it again, as the colour will work over that which is already on the canvas quite comfortably, if much has to be done, however, it will be well to wet it all over before starting, in this case the water must be applied from the back.

I find that if the paint be kept four or five days after mixing a sort of fermentation sets in, and the starch begins to decompose, when this is the case the whole mass becomes filled with minute air-bubbles, and the smell given off is rather unpleasant, in this state, however, the paint works quite as well, and if anything rather more smoothly than when fresh mixed. The smell does not remain after the background is once dry.

I think that photographers who have been doing their backgrounds with the crayon process, would be pleased if they would follow out the plan I have suggested. It is at any rate worth a trial.

Christchurch, N.Z., January 6th.

CARBOLIC ACID IN PHOTOGRAPHY.*

It has already been stated by M. E. Friedlein, at a meeting of the Vienna Photographic Society, that the addition of small quantities of carbolic acid to the bichromate sensitizing bath is of advantage. Recently M. Friedlein has again referred to the subject, and points out the advantage of employing the same acid in the case of all operations connected with gelatine. Especially is carbolic acid of use in the Woodbury process, this gentleman affirms, for without the addition of this preservative the gelatine solution will scarcely keep good a couple of days in mid-summer, and has been known to decompose in a day, with the evolution of noxious gases.

One per cent. of carbolic acid added to a thin gelatine solution, as in the case of the Woodbury process with the gelatinous ink, is sufficient to preserve the gelatine mixture in good condition for months, even in an open vessel, summer and winter alike. The only change that will then take place is the hardening of the surface through evaporation. As in the carbon process, especially in summer, and when the drying operation takes a long time, many defects occur through the decomposition of the gelatine, it is well to add to the bichromate bath a little carbolic acid. In this way the operator is assured against defects, and the

sensitized tissue may be preserved good for a week. The smell of the acid is, after all, but a slight drawback compared to the benefit it confers. In a work on the practice of carbon printing, the following formula for making up the bichromate formula is given, viz:

Bichromate of potash	...	...	30 parts
Water	...	...	800 "
Fluid carbolic acid	...	...	1 "
and in summer			
Glycerine	...	...	1 to 6 "

The carbolic acid is prepared by rendering fluid 5 parts of the crystallised acid by standing in hot water, and adding one part of warm water.

ERRORS IN THE TRANSIT OF VENUS PHOTOGRAPHS.

BY M. A. ANGOT.*

I HAVE already remarked upon the several causes which may modify the dimensions of photographic images obtained by means of astronomical lenses. The results are to be explained by the ordinary laws of diffraction, and are quite in accord with these. I crave permission to submit the results of my further research upon the photographs of the Transit of Venus.

In making photographic observations of the passage of this planet, two different objects were in view:—1, To measure the parallactic effect direct—that is to say, the difference in the apparent positions of Venus seen at the same moment at two distant stations; 2, to determine photographically the instant of contact. The first operation belongs properly to photography; the second was undertaken only to support the ordinary astronomical observations, and will form the subject of an early communication.

1. *Direct Measurement of the Parallactic Effect.*—The parallactic effect may be measured in two different ways: (a) by the angle of position, or, in other words, by the angle that is formed every instant by the line of centres of Venus and the sun with a fixed direction—that of the equator, for example; (b) by the distance between the centres of the two luminaries.

(a) Measuring the angle of position, according to former experience, one might expect to obtain an image of the sun larger than the geometric image, and one of Venus, on the other hand, smaller. The difference varies, and in notable proportions, with the sensitiveness of the plate, the duration of pose, the intensity of light, and the degree of transparency of the atmosphere. If the optical system which is employed does not distort the images in an irregular manner, the position of the centres of the two luminaries will not be in any way changed; and, theoretically, the measurements of the angle of position should yield trustworthy results. But, unfortunately, in practice we meet with very great difficulties in obtaining, with that degree of exactness demanded for calculation, a fixed direction to serve as the origin of angles of position. The American expeditions are, to my knowledge, the only ones which have sought to solve the problem; and it will be necessary to admit the publication of their results in order to learn their method of procedure.

(b) Measuring the distance between the centres. The position of the centre of the two luminaries is not modified, as I have pointed out, by the phenomenon of diffraction, which introduces into the image an optical system supposed to be perfect. The measurement of the distance between the centres should, therefore, theoretically inspire every confidence. So far experience seems to show that the dimensions of apparatus and the method of operating chosen at the French stations will give us the distance between the centres of the luminaries with that degree of exactness necessary for calculating.

But there is in the process a difficulty of the same nature

* Photographisches Correspondenz.

* Presented to the Academy of Sciences.

as that which we have noted in the preceding; it is the determination of the angular value of the images. The focal images are measured in millimetres, and in order to be able to compare the image obtained at the different stations, it is necessary to know the angular value of a millimetre placed in the focus of each instrument. It is possible, however, to obtain this value in several different ways: either by photographing a luminary—the sun, for instance—at two different and known times, the apparatus remaining fixed in the interval, and comparing the metric distance of the two images with the interval of time that separates them; or by placing in the focus of the instrument a thread micrometer, or glass plate with scales, and noting the time that a known luminary takes to pass through a given space; or again, by photographing the micrometer of a meridian lens, serving as collimator, &c.

There is, finally, a last process which, at first sight, appears to be very trustworthy, but which, in practice, gives rise to many material errors. I have shown, in operating upon objects uniformly lighted, having rectilinear margins, and dimensions very much larger than the zone of diffraction, that the augmentation of the image of a luminous object is equal to the diminution of that of the obscure object in the same circumstances. The sum of these dimensions is, therefore, constant, and equal to that which it ought to be if the image were formed simply according to the laws of optical geometry. If always exactly the same for the sun and for Venus, the diameter of these two luminaries, though varying in one image and another, will thus give a constant and unvarying total; and this total might serve as the factor of reduction for the purpose of comparing among themselves the images of different stations; so that it would suffice, under the circumstances, simply to determine exactly the angular value with one instrument.

Unfortunately, it is impossible to rely upon the constancy of the factor for several reasons:—

1st. The diameter of Venus is far from being of considerable dimensions taken in relation to the different zone. Theory shows, therefore, that the diminution of the diameter of Venus is not the same as that which takes place in a rectilinear margin, the sun having a curve slight enough to act sensibly as a rectilinear margin.

2nd. The luminous intensity of different points in the sun is not at all uniform; it decreases rapidly towards the limb, by reason of the physical nature and convexity of the luminary. Venus is projected upon a point on the sun much more luminous than the margin, but the intensity of which is always varying as the planet moves over the surface of the sun. The augmentation of the sun is, therefore, different to the diminution in Venus, and the sum of their diameters varies with all the conditions of the experiment.

These conditions depend materially upon the sensitiveness of the plate, the duration of exposure, and the transparency of the atmosphere at the moment when the photograph is secured, and it would be impossible to keep count of these.

These provisions have been confirmed by experiment, and, what is more, the measurement of the images of the Transit will afford evidence of these causes of error, and demonstrate that to determine the angular value of each instrument it will be necessary to have recourse to one of the other methods above described.

PHOTO-COLLOTYPE PRINTING.

BY M. T. H. VOIGT.*

PRINTING in greasy ink has received some marked improvements from the hands of M. Albert. In the under-mentioned formulae, which are those that gentleman employs, all the substances of no use which we find in the former processes are put on one side, and it is only necessary to pay attention to the manipulations in order to arrive at excellent results.

Formula for the First Film.

Gelatine, dissolved at a mild temperature in 270 grammes of water ... 15 grammes
Bichromate of potash, dissolved in 270 grammes of water ... 34
Albumen beaten to a froth ... 210

The liquids are added one to another, well mixed, and filtered while warm. Polished glass plates are covered perfectly with ammonia, and put upon a lattice of wood, then put upon a stove and warmed. The plates are then covered with the above mixture of albumen and gelatine, a flat brush being used for spreading the liquid. In applying polished instead of unpolished iron, as I have recommended, the film to be applied must be a thin one. The plates are dried at a temperature of 35° Reaumur. The mixture for the first film may be preserved for some time. In heating, it becomes an opaline jelly, which must be warmed and filtered before it can be employed; but in doing this the operator must be careful not to go beyond 40° Reaumur, because of the albumen in the mixture. As soon as the film has dried it is covered with a cloth or piece of velvet, and the plate exposed to sunlight from the back. Hence the plate is put a Vogel photometer, in which is placed a sheet of paper coated with the same mixture as that upon the surface of the plate. The exposure is prolonged until the photometer marks No. 12 on the scale. The plate is then plunged into cold water for an hour, and it is finally rinsed in cold water and allowed to dry spontaneously.

Second Film.

Gelatine, dissolved in 720 grammes of warm water ... 90 grammes
Isinglass, boiled in 360 grammes of water 45
Bichromate of potash and ammonia, of each equal parts, dissolved in 180 grammes of water ... 45

These three solutions, well filtered, are mixed and warmed to 42° R. before being applied to the already coated plates.

The second film may be prepared a long time in advance, but the plates once dry will only remain in a good condition for some days. They must be employed and washed as soon as possible, after which they will preserve for years the property of taking ink.

I will indicate a very excellent formula for the second film, proposed, I believe, by my compatriot, M. Obernetter, to whom we owe a great many photographic improvements. Albumen, to the extent of 150 grammes, is beaten to a froth, as much water and bichromate of potash (of each 150 grammes) being gradually added during the operation. As soon as the mixture has been made, there are added 30 grammes of ammonia, which is done carefully; after standing for some moments, the liquid may be filtered through a bit of flannel. This mixture will keep good for years; indeed, it improves by keeping.

The plates are first of all covered in a cold state with this mixture, then dried by being subjected to a gentle heat. They are then exposed to light from the back in the manner above indicated. After washing, they are covered with a second film.

A drying box of wood is divided into two compartments by a thin sheet of sheet iron, under which pass some tubes leading the heat from a furnace. In this way there is produced in the upper compartment a temperature of about 50° R. Into this upper compartment is put upon the sheet-iron diaphragm an iron tripod, and the door is closed with a tuft of cotton wool coloured yellow, so as to absorb the moisture produced by the desiccation of the plates. This drying apparatus, with some modifications, is that generally employed, only the tripod is ordinarily replaced by rings of iron, the position of which is altered by means of screws. The rings are so fitted that they may be approached or distanced from one another according to the dimensions of the plates.

The tube through which the smoke and heated air

pane may be replaced by a gas stove or petroleum jet under the drying box. A square opening, closed with yellow glass, which allows one to follow the drying of the plate, is fitted to the upper part of the box, which is also pierced for a thermometer to note the temperature of the apparatus.

The plates, when dry and cold, are exposed to light under a negative in the manner already described. The printing frames differ somewhat from those in general use. The negatives and the sensitive film of gelatine are pressed one against the other by the wooden corners, the springs not giving sufficient pressure to assure perfect contact and printing. The sides and end are raised to permit one to superintend the printing, and to avoid the introduction of light from behind. The bottom of the frame is formed by a wooden shutter, and the whole is put into a shallow box.

When the plates have been printed, they are put into a metal bath full of water, where they are allowed to remain, taking care to change the water from time to time, until the printed gelatine has completely lost its yellow colour. If the water is frequently changed, the plate will have been sufficiently washed in two or three hours.

As soon as the plates curve out of the water, they are washed with care under a stream, and they are then dried by pressing upon them with the hands some sheets of blotting-paper. They may at once be inked and employed for printing copies, but if a large edition of pictures is required, then it is best to let the plate remain in its present condition for a day or two.

Recently it has been thought necessary to have special presses for this kind of work. At Munich numerous experiments were made with the roller press, but it was soon found to be unsuited for the purpose. These presses are constructed like the cylinder presses, in which the steel plate is set in motion without being sustained underneath, the only difference being that the rollers were covered with india-rubber. After pulling a print, it was necessary to lift out the plate, ink the roller, put it back between the cylinders, and cover it with flannel or with a sheet of rubber, and go through the printing process once more. Besides the risk of breaking the plates, the process is beset with the inconvenience that two persons are required to manipulate the press, while at the same time but very few prints are pulled in a given time. Besides these presses, that of M. Roderer is also employed, with which the printing goes on more rapidly and easily. This press is a cheap one, but the roller, as also the whole of the machine, being of wood, it soon wears out.

The so-called star press (of Munich), employed by MM. Obernetter and Gemeser, fulfils its object admirably. It is constructed of stout woodwork, with rollers and levers of iron. It is easily worked, and wears well.

The Sutter presses, notwithstanding their high price, are preferable for collotype printing to all the others, by reason of their being constructed of iron. They should have double frames. Upon one of these frames is fixed a sheet of paper or tin, cut to the size of the print that is to be printed; or four bands of thin metal may be arranged so that they form a frame-work that can be opened out or contracted according to the dimension of the image to be obtained; the second is covered, as in the lithographic press, with thin leather. If we suppose that the plate, before being placed in the press, has been properly inked with the roller, the first frame is put over it to preserve the margins of the print white and clear; then the paper is put upon the printing block, and the whole is gently passed through the press. The amount of pressure is first of all regulated, the same being rather less than that exerted in lithographic printing upon stone. Thanks to the modifications we have indicated, little difficulty is felt in working the collotype process in lithographic establishments.

(To be Continued.)

A NEW PROCESS OF HISTOLOGICAL STAINING FOR MICROSCOPIC SUBJECTS.

BY FRANCIS ELIZABETH HOGGAN, M.D.

THE tissues to be stained are principally membranes or soft sections, which may be either fresh, frozen, hardened in alcohol, or hardened by the picric acid and gum process; but such hardening agents as the chloride of gold or any chromate whatsoever are inadmissible. The colouring agents required are: 1, a one or two per cent. solution of perchloride of iron in distilled water or alcohol (tincture of steel); 2, a solution of similar strength of pyrogallio acid in water or alcohol, the latter fluid being preferable in both cases. The section or membrane to be stained is first treated for one or two minutes with alcohol; the iron solution is filtered upon it, allowed to remain for a couple of minutes, and then poured off. The pyrogallio acid solution is then filtered in a similar way upon it, and in the course of a minute or two, the desired depth of staining having been obtained, the tissue is washed and may be mounted, in the usual manner, either in glycerine balsam, or varnish. The nuclei and nucleoli will be found coloured black, and the cell substance will also be coloured more or less, according to the age and other conditions of the cell. A bluish tint may be given to them by washing the section with an alkaline water; the household water of London, containing lime, is suitable for this kind of tinting. This process is especially useful for photographic purposes, and to those who can only work with the microscope in artificial light, the definition being very clear and distinct. It is probably the best process for staining silvered preparations, as it has no effect on the black lines, while it makes the nuclei very distinct. I have advised that the solution be filtered upon the preparation. This, although unnecessary with clean fresh solutions, obviates any chance of foreign matter becoming deposited on the preparation. It is easily effected by taking a piece of blotting-paper about two inches square, folding it twice, and pouring into one of the cavities thus formed about a teaspoonful of either solution, or more, according to the size or number of the materials to be stained. The whole process is speedy, simple, and permanent. The staining may be accomplished in five minutes, and the staining materials can be bought at any country druggist's shop. The filtering paper should be held with forceps to avoid staining the fingers, as the stain is difficult of removal except with the bicarbonate of potash.

THE CARBON PROCESS SIMPLIFIED.

BY R. JASTRZEMSKI.*

THE carbon prints that were first exhibited awakened in our breasts the most sanguine expectations. Unfortunately, failures and defects have arisen in the practice of the process which have rendered this interesting printing method almost impracticable for general use, while its complicated nature, compared to silver printing, is also a material point to its disadvantage. It has been my endeavour to simplify the process as much as possible, and to obviate the source of error as much as possible.

One of the great disadvantages in the practice of carbon printing is the coating of so many glass plates with collodion; not only is a suitable space required for it, but, moreover, the ether vapours are decidedly noxious to one's health. In the same way the preliminary coating of the plates with wax by the aid of a benzole solution is a very disagreeable operation, and the rubbing of the glass surface with wax is a barbarous one. By the aid of the simplification which I have imported into the process, and which is the result of many repeated experiments, I have rendered the waxing of the plates altogether unnecessary, for this coating can be put on much more advantageously at the tissue factory itself.

If the tissue itself is coated with collodion under certain conditions, there accrue therefrom many advantages.

* *Photographic Correspondent.*

1. The waxing of the plates is in the first place avoided, as well as the collodionising of them. The finished picture, too, easily comes away from the glass.

2. All tendency to reticulation (by reason of the tissue becoming horny) is avoided when the surface of the material is kept together by means of a film of collodion. Of this one may easily be convinced by coating a piece of tissue, which otherwise shows the defect, with collodion. The operator will be perfectly surprised how clean and free from defects the image will be developed, whereas the same tissue which has not been treated by my method affords pictures that are not to be criticised. By means of the improvement I suggest, the pigment tissue may, indeed, be kept in a good condition the whole summer through.

After essaying a series of methods, I found the following to be the most successful. A piece of pigment tissue is stretched by its four corners by means of pins upon a board, and then collodion (in its normal condition, and about one and a-half per cent. strength) is applied in the same way as in coating a plate. When the collodion is half set it is taken from the board, and rapidly dipped into a pan of water and moved to and fro until all appearance of greasiness has disappeared, when it is allowed to dry upon a slanting board. After it is perfectly dry, the surface is rubbed over with the well-known wax solution (wax-resin-turpentine) in such a manner that nothing, however, remains behind. This coating must be perfectly dry before the tissue is employed. Prepared in this way, the tissue may be sensitized on the day following; or, if permitted to remain in its unsensitized condition, it will keep good for an indefinite period. It is evident, therefore, that tissue thus prepared could be purchased ready for use.

The manipulations connected with the process are the following. The tissue in the condition I have mentioned is sensitized in a solution made up of—

Bichromate of potash	...	...	4 parts
Carbonate of soda	...	...	1 part
Water	...	...	120 parts.

The tissue is dipped bodily into the solution, and permitted to remain in the liquid for three minutes. The tissue, after drying, is put into the printing-frame and exposed in the ordinary manner; it is then put into cold water in the usual way, and put upon a clean glass plate, the superfluous water being expelled by the aid of a strip of cardboard, instead of rubber squeegee, which is used very energetically. It is well to put the plates to be developed one upon the other with sheets of filter paper between, and allow them to remain, weighted to a certain degree, for about half-an-hour—rather longer than shorter—and in developing it is advantageous to begin with very warm water, the paper backing not being removed until it will leave on the touch of a finger, and strips off the surface, when it is carefully lifted off.

After complete development the image should be permitted to remain for half an hour in a solution of alum, when it is rinsed and put on one side to dry. The transfer to paper takes place in the ordinary way, drying by artificial means being avoided.

The retouching of the pictures is best done by the aid of pigment dissolved in luke-warm water to which a few drops of acetic acid have been added. If there is much to do upon the pictures, or the glossiness of the surface is interrupted in patches, a coating of varnish may be given, which heightens the effect, and also shields the print against moisture. Only in this case care must be taken to employ a varnish so thin that it will not interfere with the surface of the picture, while at the same time it will bear scratching.

I may remark that in the sensitizing bath I do not employ, as may be seen, any ammonia, but use bichromate of potash to which is added one-fourth part of carbonate of soda. I have found, as the issue of many experiments, that ammonia is, in a great measure, the cause of reticulation in the film.

The exceeding simplicity of the above communicated pigment process will, I hope, have some effect in securing for carbon printing a wider application, if only supported by the makers of carbon tissue and carbon requisites.

SOME THINGS SEEN AND FELT.

BY I. B. WEBSTER.

"Loads" of dirt have been removed, and the effect is most gratifying. In the February number I gave a view of things as they then appeared, and knowing what medicine would effect a radical cure, I began by clearing out the cause. The root of the evil "walked out," having a pair of feet made for that purpose. A negative free from holes was a rare thing to see up to that time, and now a negative with holes is truly a rarity. The same bath solution is still in use, as is also the same camera, shields, &c. I wish I could exhibit the metamorphosis to photographers that persist in wallowing and slobbering through their work, slinging things about as a common labourer working on the street would do. I simply filtered my bath, wiped out my shields, and went to work according to my old and well-tried rule of "careful manipulations." Read my paper as it was published in the proceedings of the National Photographic Association at Philadelphia and Buffalo. I recommended certain ways for doing certain things, and I know that good results will follow always. For instance, during the past three years, I have trusted others to prepare glass, supposing they would keep up my "tried plan," but rusty glass became the rule. Why, I could not tell until this present experience, and now I see it all quite plain. The rule that works well is this. Make a strong solution of concentrated lye, immerse the glass in it one at a time (I treat varnished negatives and new glass alike); leave them in the solution until they are clean; then, with a rag, tuft of cotton, or patch, wipe them (rub hard) all over both sides, and then wash the lye all off with water, after which immerse them in a dish containing commercial sulphuric acid (strength unimportant), where they ought to remain at least one whole day; take them from the acid singly; let them drip well; wash in water, and pass them into water, where they will remain until you are ready to albumenize. Do not allow the glass to dry from the time it is first put into the lye until after it has received the substratum of albumen. This is an important point.

I am working up to this routine, and my supply of rusty glass is diminishing rapidly, and I fail to get a "map of the world" on my negatives. By giving a little attention to this every day, it will be but a short time until you will find a large supply of good plates on hand ready for use. I use the white of one egg to from ten to twenty ounces of water, and add a little iodide of potassium to clear it, and a few drops of ammonia to improve its keeping qualities. If the solution is too strong of egg, the film of the negative will come out rough. Filter with care before using, and be careful in setting the plate away to dry, in order to prevent foreign matter from coming in contact with the albumen surface while wet. Above all things have your hands free from silver, soda, cyanide, or other deleterious solutions, or it is sure to spoil all your plates. Use a rack to dry the plates, as that gives a chance for the solution to run off the corner, and besides, there is no fear of capillary attraction carrying some destructive element upon the surface. Of course you old readers will fail to see any good in this rehash, nor would I two months ago; but my late experience teaches me that even old ones can learn if they will. I write this for those who read, and ask them to think it over.

There is another point I wish to make in this communication which I found all out of joint again, and that is the manner of dipping the plate in the bath. If you will refer to the papers mentioned above, you will see that I recommended that the bath be so tipped as to bring the back of the plate up. It is recommended by some writers to fix the bath-dish on an axis, so that it will tip to and fro, which is all very well, but not necessary. The glass bath is

generally set in a wooden box, sufficiently broad at the bottom to make it safe to keep it standing upright. Nothing else is needed. Keep the bath-dish upright all the time, tipping it back just enough to allow the dipper holding the plate to be easily immersed, and then straightening it up again, in which position it should remain until the coating is accomplished. Then tip back, remove the plate, and straighten up again.—*Philadelphia Photographer.*

Correspondence

CARBON EVILS.

SIR,—While many of us have been shouting "*Vivat chromotype!*" few have recorded their experience of coloured chromotypes. Every photographer who has seen or heard of Lambert must remember what wonders were to be accomplished with albumen colours; although Lambert did not say they were permanent. I am one of his everyman-his-own-artist pupils, and have tried the colouring of chromotypes with some success. Enclosed you will find a carte painted in this way a year ago, and on looking at it you will at once say, "The colours, although pretty to look at, are good for nothing; they will soon fade." This should be known as widely as possible, both by photographers and the public.

I have before me a very neat circular, issued by a carbon man to his patrons. On one page he sings the praises of coloured chromotypes in the following terms:—"The colouring matter of these pictures is incorporated with the material of which they are composed, not on the surface, as is the case with ordinary coloured photographs; hence their beauty and durability. They are done all sizes, from carte upwards, and are made to resemble the finest burnt-in enamel, and have been pronounced by those best able to judge as absolutely permanent." This is all very prettily printed in gold-bronze after Marcus Ward's best style; but if it isn't true?—"There's the rub."—Yours truly,

JO. VESTRIS.

THE SILVER BATH.

SIR,—Having had some little experience for some years past with cyanide in the negative bath, perhaps I may be allowed to add a few words to the present discussion upon its effects. I have always been in the habit of mixing my bath in the old style. Distilled water, pure silver iodide of potassium, and nitric acid, *quantum suff*; before adding the iodide and silver, sunning; some time after adding a trace of carbonate of soda; I then filter and acidify. By these means I believe I obtain a bath of the most perfect possible purity, as every trace of organic matter in the water is precipitated under the action of light.

Some weeks ago I made up a new bath as usual, and worked it very hard for some time, when, without any warning, it fogged; the fog could be wiped off the film, leaving the image pure and bright by reflected light, but very streaky in the direction of the dip. A solution of about a quarter of an ounce of cyanide in an ounce of water was made, and sufficient added to cause a permanent precipitate; after filtering the bath gave excellent negatives without further addition. The other day a further supply of silver in crystals was added to strengthen it, after which it fogged again, but was once more cured by the same process. The bath is now neutral and very rapid. Upon both occasions fine needle-like crystals were deposited after filtering, which were again filtered out. I send one of my filter papers for your examination. Perhaps you will be kind enough to inform me what the precipitate consists of.

My experience of cyanide in the bath amounts to this—that it is in nine cases out of ten an immediate and effectual remedy for fogging, and leaves the bath pure and nearly neutral. I therefore advise all operators to give it a fair trial.—I am, sir, yours truly,
W.
Tuunton, April 18th, 1877.

[We have not time to make an analysis, and the amount of filtrate is too small for effective examination. It is, doubtless, chiefly cyanide of silver, and has that appearance.—ED.]

To Correspondents.

A. E. S.—The word *cliche* is a French word, and is commonly used in photography as an equivalent for a negative. In its wider signification, it means any plate that can be printed from. (2.) The nitrate of iron developer may be prepared in various ways; but the following is considered the best. Dissolve
Nitrate of baryta (powdered) ... 1 ounce
Water ... 8 ounces

In a separate vessel dissolve

Protosulph. of iron ... 1½ ounces
Water ... 8 "

Mix, and decant or filter, to remove the white precipitate, which is sulphate of baryta. 3. The exposure for nitrate of iron is about the same as for sulphate of iron development. 4. The filling up of fine lines in intensifying reproductions of fine engravings somewhat depends on the intensifier used. If a sulphide be used for development it will not fill up much. Some operators, in such cases, develop, fix, wash, and dry the image; then run round the plate an edging of varnish; wet again, apply a five-grain solution of bichloride of mercury until the image is of a uniform grey tint, wash, and apply a two-grain solution of iodide of potassium. 4. A wet plate from which all free nitrate of silver has been washed cannot be developed with an ordinary developer without the addition of nitrate of silver. It may be developed, however, by the alkaline method; but the collodion should possess a larger proportion of bromide than is generally used in ordinary collodion for wet work. 5. The distance the camera should be placed from an object to reduce it to a given scale depends upon the focus of the lens. If, say, you wish to take a copy of an object one-tenth of the original size with a lens of ten inches focus, it must be placed at a distance of nine feet two inches, which is ten times the focal length of the lens, and one focus added. Again, if you wish a reduction of twenty times with a lens of six inches, the distance would be one hundred and twenty-six inches, being twenty times the focal length and one focus more. 6. It is possible that you may obtain gun-cotton made at a high temperature, of some manufacturer, but it is not an article kept in trade, as a rule. We believe Mr. Rouch manufactures some. Hopkins and Williams also. We believe that Mr. Werge keeps pyroxyline. 7. We don't remember any substance of the nature of asphaltum which is white in colour. White shellac is perhaps the nearest. This will dissolve in alcohol, by the aid of gentle heat. 8. Glycerine is the best aid to keeping a moist plate for a few hours. 9. To make polished metal goods dull, so that they may be more easily photographed, make them very cold, and place in a room containing warm vapour. This vapour by condensing on the surface makes them dull. If a cup or other hollow vessel, may be made cool enough to condense the ordinary vapours of the atmosphere by placing a piece of ice in.

LUX.—We prefer the ridge form in preference to a sloping front light. But if you prefer the latter, the form indicated by diagram No. 1 in your letter, being simplest, will answer best.

A. Z.—The mixture of citric acid and nitrate of silver you mention is not intended for use as an intensifier alone. It is intended to be added to a solution of pyrogallio acid, or a solution of iron. Many photographers use it to add to their ordinary iron developer, and after developing, proceed, with a little fresh iron solution and the citro-silver solution, to intensify.

GALA.—Bronze powder will not in any way affect a carbon print, and the cards may therefore be used. There is one objection, however: if the carbon prints so mounted be placed in an album with silver prints the latter will assuredly suffer. 2. The best kind of negative for retouching is a clean thin negative, without any trace of fog. It should not be much intensified.

GREEN.—Yellow tannin may be obtained of most drapers.

S. S. (Jersey).—We should of the two prefer *Rues*. For a person not versed in dry plate operations, we should recommend the coffee process. That you mention is very excellent, but we should think difficult to manage for a beginner.

A. CLARKE.—There is no work on opal pictures that we know of. Jo. VESTRIS.—We fear that your drama "*The Sage of Surbiton*" will scarcely be suitable for publication in our pages; but it may be interesting to see the manuscript.

M. B. F.—For ordinary landscape work—that is, for taking views of natural scenery—a single landscape lens will answer every purpose. Portraits may be taken with such a lens, especially in the open air in a good light. It will not give portraits as sharp as a good portrait lens, but for large heads it will give sharpness enough.

Several Correspondents in our next.

The Photographic News, May 4, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

AN INSTANCE OF THE IMPORTANCE OF PHOTOGRAPHIC ILLUSTRATION—SCOTELLARI'S PROCESS IN VIENNA—A NEW TEST PAPER.

An Instance of the Importance of Photographic Illustration.—We have been favoured with an early inspection of a technical work, which proves in a most striking manner the value of photography for purposes of illustration. We allude to a treatise on Gunpowder Machinery, from the pen of Mr. J. C. Hay, C.E., the Inspector of Machinery to the War Office. As our readers are doubtless well aware, Great Britain provides much of the machinery for other countries; and not only in Europe, but in far-off China and Japan, British engineering has acquired a reputation which testifies amply to the skill and ingenuity of Englishmen. But machinery such as is set up now-a-days in our factories and workshops is rarely simple enough in its character to be easily understood; and when foreign purchasers receive their goods, much still remains to be done in putting the same together, and placing in working order. In many cases, no doubt, native engineers are forthcoming, to whom the working of the engines and plant might well be entrusted; but, in the first place, they must know how the machinery is to be set up, and its general aspect when at work. Again, there are would-be purchasers, who want to know something of the machinery, first of all, in which they are about to invest their money, and desire to learn its nature and character before acquiring it. It is to satisfy these classes that the treatise in question has been prepared. The book, as we have said, relates to the manufacture of gunpowder, and in it are to be found a series of a dozen or more photographic illustrations of the machinery employed in this class of work. One plate shows "the incorporating mill," where the ingredients are ground together; another, the "mixing machine," and so on. The photograph shows that it is a real machine here set up, and not an experimental structure. If but a drawing had been given, there would be no proof indeed that any machine of the kind described in the treatise had ever been constructed; and purchasers of machinery, it should be remembered, like to know that the firm from whom they receive their goods have had some experience in the manufacture. It is nothing new, as engineers will tell you, to show a drawing and describe a machine of the making of which a firm has as little knowledge as the purchaser himself. For this reason, therefore, photographic illustrations are peculiarly valuable in a work of this sort. Those who study the volume may rest assured that the author is experienced in the subject of which he treats, while at the same time the reader knows that the Birmingham firm, Messrs. Taylor and Challen, under whose auspices the book is published, and whose machines are here represented in working order, are thoroughly acquainted with the manufacture of the gunpowder machinery which the book describes. Another point, which beginners will at once appreciate in respect to these photographic illustrations, is this. Had the volume been illustrated by minute and detailed working drawings, which would have been necessary in order to secure the full confidence of would-be purchasers (if photographers had not appeared), these drawings could have been used by unscrupulous firms abroad and at home, in building up the machinery for themselves; so that after an engineering firm had lost much time and trouble in working out a series of machines, and constituted the manufacture of these a speciality, others would come in and enjoy the fruits of its labours, by having recourse to the drawings published. Now in the case of photographs the matter is very different. Although a camera picture conveys to the mind a wonderfully clear conception of the manner in which a machine

works, and is an invaluable supplement to a working drawing, it is of itself almost useless in the hands of a mechanic. The lens has given every bearing, every screw, and every wheel out of proportion, and to seek to work by scale, with the aid of a photograph only, would be a most disheartening job. Thus, as we desire our readers to understand, photography has been most aptly made use of in this instance, for both the advantages and shortcomings of the process have been made to tell in the application.

Scotellari's Process in Vienna.—M. Scotellari's proposition to employ violet glass in the studio has not been better received in Vienna than with us. Indeed, after the unfavourable report of the commission appointed by the French Photographic Society, we are not likely to hear much more of the subject. In Vienna, M. Fritz Luckhardt, the well-known portraitist, experimented in the matter, but his trials failed to confirm the statement of M. Scotellari. M. Luckhardt essayed the violet light in two ways. He exposed a plate in the camera, one-half of which was covered with violet glass. In this case the difference, if any, was against the employment of the tint. Next he exposed a negative to the light in a printing frame, covering it with alternate stripes of violet and transparent collodion varnish; in this case the print was a little paler where the violet varnish had covered it. M. Luckhardt essayed to obtain some of the violet varnish and curtains direct from M. Scotellari's agent, in order to make as impartial a trial as possible; but it is only to licencees, it appears, that these materials are sold. A circular of M. Scotellari states that the cost of adapting a studio in the manner recommended by that gentleman is about fifty francs, supposing the atelier does not measure more than ten square metres. It may be mentioned that in Vienna this is not the first experiment that has been made with studios of coloured glass. The court photographer, M. Angerer, whose works were better known a dozen years ago than they are now, built a magnificent studio with blue glass, which we had the pleasure of visiting soon after its erection. In the end, however, it was found to offer no advantage over studios glazed with ordinary glass. M. Luckhardt seems to think that the charming soft illumination emitted by violet light has led, more than anything else, to a belief in its more valuable properties.

A New Test Paper.—Litmus paper has so long retained its position among chemists as one of the best and most delicate tests for acids and alkalies, that it is not likely to be replaced. Moreover, the cost of preparing paper with litmus extract is so small that test papers can be produced at a very small cost indeed. However, some experiments, made by M. Frebault, and reported in the *Journal de Chimie et de Pharmacie*, deserve to be mentioned, as pointing out that litmus and turmeric are not the only substances that can be employed without trouble for test purposes. M. Frebault uses the picramates of potassium and sodium, which have a bright red colour, and turn greenish-yellow when treated with the weakest of acids. Filter paper soaked in a solution of picramate of calcium may also be used for testing for acid in the same way, and, according to M. Frebault, may advantageously replace litmus test paper.

COMPARATIVE EXPERIMENTS WITH DRY PLATES.

BY H. J. PALMER, M.A.*

A PROJECTED photographic jaunt among the peaks and passes of Switzerland in the course of the coming season, and the very laudable desire to bring home with me as perfect a batch of negatives as possible, have led me to experimentalise upon the different kinds of dry plates which were accessible to me, with a view to the final selection for work among the Alps of that process which

* Read before the Liverpool Amateur Photographic Association.

would seem best adapted to supply me with the perfection I aim at.

My experiments in this direction proved so interesting to myself, that I became impressed with the possibly erroneous notion that the detail of the results of my work might be of interest to others, and, indeed, useful, to some extent, as well. Accordingly, I determined to suggest them as a subject for discussion to-night, and without further apology will proceed to lay these results before you.

It will, of course, be clearly understood that in my remarks upon the various dry plates upon which I have been operating lately, I do not presume to say that this class of plate is necessarily faulty, and that necessarily good; I merely wish, as a dry-plate worker of some years' experience, to state how these plates have behaved in my hands, and to give a few accurate data which may, I think, prove useful to others in their work.

The following are the plates whose sensitiveness and general capabilities I have been testing in my late experiments:—Coffee, gelatine-bromide with water, gelatine-bromide with beer, Liverpool rapid, London, collodio-albumen, uranium, and Warnerke's tissue. I have endeavoured to expose these, as far as possible, under precisely the same conditions of light, upon the same subject, in the same camera, and with the same lens and diaphragm. The development has, of course, been varied to suit the requirements of each kind of plate. I have used the formulae prescribed by the several makers for their respective plates, and have in all respects endeavoured to deal fairly and impartially, and to obtain the best results to be had.

The subject I selected was Wallasey Church; the lens was Dallmeyer's medium-angle rectilinear, the stop that numbered four, and the light that of a misty sun, with the accompaniment, decidedly unfavourable to photography, of an east wind. The duration of exposure required by each plate was ascertained as accurately as possible by the plan of giving four exposures on a trial plate. Thus, for example, four slices of a uranium plate were exposed for five, ten, twenty, and thirty seconds respectively. The result proved that the portion of the plate exposed for ten seconds gave the greatest vigour under the developer, and this time was adopted accordingly. I have arranged some of the results in a tabular form, as follows:—

	Exposure	Development	Intensification	Result
Coffee	330 seconds	15 minutes	To any extent	Good
Gelatine-beer	30 seconds	7 minutes	Easy, but not required	Very good
Gelatine water	7 seconds	6 minutes	Difficult	Thin
Liverpool rapid	40 seconds	10 minutes	Easy	Very good
London	140 seconds	9 minutes	Easy	Fair
Pollitt	400 seconds	45 minutes	Easy	Very good
Uranium	7 seconds	13 minutes	Difficult	Fair
Warnerke's tissue	40 seconds	10 minutes		Good

The following, then, is the order of rapidity:—Uranium and gelatine-water (nearly the same, but slightly in favour of uranium, this plate showing signs of over-exposure), gelatine-beer, Liverpool, Warnerke's tissue, London, coffee, and, lastly, collodio-albumen.

The quickest to develop are the gelatine, the slowest the collodio-albumen, while the coffee plates preserve a safe

medium. Gelatine pellicle plates made with water are, as a rule, very disinclined to intensification by acid silver, but acquire a slightly augmented density when treated with chloride of copper and subsequent alkaline pyro. On the other hand, gelatine-water plates made from an emulsion in which bromide of ammonium is employed will intensify readily. Gelatine-beer, Liverpool, London, Pollitt, and coffee plates will acquire any amount of density with acidulated silver; but the uranium, in my hands, obstinately declined intensification. My classification in order of excellence is as follows:—1. Gelatine-beer. 2. Pollitt. 3. Coffee. 4. Liverpool. 5. Gelatine-water. 6. London. 7. Uranium.

The negatives themselves will enable those who please to do so to readjust the order of this classification. The gelatine-beer plates, in my (possibly unskilful) hands, have proved the only ones which produce anything like freedom from stains, spots, pinholes, stripes, &c., and, at the same time, may be depended upon with absolute certainty (provided they are guarded from damp), for a dense, brilliant, and printable negative. I have been unfortunate in my batches, both of London and uranium plates; for I failed to find a single plate in either package which was free from defect in the structure of the film. I have never tested the London plates before; but I have often obtained the most perfect results from the old uranium plates. I do not appreciate the dense films of the latter as they doubtless deserve. They put an end, it is true, to all change of blurring; but it seems to me that the advantage is gained at the expense of brilliancy.

The collodio-albumen and coffee plates give much the same character of picture, and that one of the greatest delicacy and beauty, combined with vigour and brilliancy. With regard to the former, however, although the resulting negatives are often perfection itself, there is the counterbalancing disadvantage of their exceedingly sluggishness under the developer. To an amateur with, necessarily, very limited time at his disposal, the undoubted truth of a new application of an old adage, "*Ars longa, vita brevis*," comes home with a painful force when he faces, as I have done, at the close of a photographic "out," many dozens of exposed collodio-albumen plates, and all to be developed at the rate of forty minutes per plate.

My coffee specimen needs some apology. I was in a great hurry to produce it, and had no time to apply a substratum; hence the defects which are evident upon the film. I am, however, much pleased with these plates. I had never produced a coffee plate before; but with the aid of an old number of the *British Journal*, I obtained a successful batch at my first attempt. As the image appeared under the developer, it was quite equal, with the exception of the pinholes, to the best of my gelatine friends. It was only on the slipping of the film, and in my efforts to save it from destruction, that the damage was done to the negative. The crop of pinholes manifest upon this and upon the collodio-albumen plates might, perhaps, have been avoided by the use of a new bath. In the collodio-emulsion plates I know not how to avoid them. But here comes in the manifest advantage of the gelatine process. There is absolute certainty, with a gelatine emulsion, that every plate in a batch will be precisely like to its fellows. This is not so with bath plates; nor is it the case with collodion emulsion. The bath may sicken of one or more of the many ills to which baths are liable in the very middle of the process of the preparation of a batch; and, as to emulsion, there is no doubt that evaporation produces a speedy difference in the consistency of the films, and therefore a difference in the character of the resulting negatives.

I have lately returned from a few days' camera work in Wales, and here I had an opportunity for testing plates of different kinds under the most unfavourable circumstances of light and weather. Liverpool plates gave me some beautiful results; but some of these split up into multi-

tedious fragments of film during drying. Gelatine also afforded me some excellent negatives, in spite of the most deplorably bad light. Blurring, however, set in to an unusual extent, and I shall never again venture to use these plates in the field without backing.

I am sorry that I have been unable to make or procure plates prepared by some of the other well-known processes. I hope, however, that what I have done, and what I have said with reference to the few specimens before us, may afford us a theme for an interesting and profitable discussion this evening.

PHOTOGRAPHIC POISONS AND THEIR ANTIDOTES.*

UNDER this heading it is proposed to treat merely of the more prominent symptoms upon the human system of such chemicals in the photographic laboratory which are most injurious and most commonly employed; the antidotes alluded to are also such as can be promptly made use of in case of poisoning by any of the above chemicals. It must always be borne in mind, however, that in order to verify the symptoms of a patient in a case of poisoning, the calling of a doctor should not be dispensed with for a moment. The more important antidotes are specified because a doctor is sometimes not to be obtained speedily enough, and because, too, the photographer may be called upon himself to give personal assistance. That both accidental and intentional cases of poisoning occur from time to time in the photographer's studio is only too well known, and the exercise of the greatest caution in regard to noxious chemicals does not, nor will it ever, cause a cessation of these lamentable occurrences.

Accidental poisoning occurs sometimes from technical, and sometimes from economical reasons; the most numerous cases are, however, wilful, and, of course, in these cases precautions are all but useless. Suicide by poisoning is, nevertheless, not so frequent as some people may imagine; in Austria, for instance, not more than thirty-three suicides come by their death by such means.

Sulphuric, Hydrochloric, and Nitric Acids.—Symptoms: Very acid taste, a vivid burning in throat and stomach, fearful stomach-ache, choking sensations, painful and acid sickness, the vomit containing blood and a chocolate-brown substance (or yellow in the case of nitric and hydrochloric acids), insatiable thirst, rising of the stomach, red, sanguineous, and white urine, small but quick pulse, cold hands and feet, great fear and restlessness.

Treatment: The patient should drink large quantities of water containing white of egg or soap; or water containing calcined magnesia, or, if this is not at hand, chalk, egg shells, or lye-water.

Chromic Acid and its Salts.—Symptoms: Great inflammation of the stomach and kidneys, the vomit of a bright yellow colour, while purging rapidly sets in.

Treatment: Magnesia or bicarbonate of soda in water. Oxhydrate of iron, as also solution of tartaric and citric acids, are recommended, as well as sugar, water mixed with some syrupy substance.

Oxalic Acid.—Symptoms: Acid taste, burning in throat and stomach, rapid vomiting of blood and darkly-coloured substances, rapid sinking of strength, slow beating of the heart, very weak pulse, cold blue colouring at the finger ends, cramplike convulsions.

Treatment: Administration of lime-water; or, if this is not at hand, of powdered chalk or egg-shells. Further, may be administered, black coffee, musk, and camphor.

Chlorine.—Symptoms: Very active attack upon the mucous membrane of the breathing and olfactory organs, difficulty in breathing, inflammation of wind-pipe and lungs.

Treatment: Breathing of spirit of wine vapour, smoking

a mild cigar, careful sniffing of ammonia or aniline, and drinking of sweetened liquids containing alcohol.

Iodine and Iodine Compounds.—Symptoms: Similar to those given by mineral acids in case of direct swallowing of iodine or tincture of the same; brownish-yellow vomit, and, in case starch is present in the stomach, this will be rendered of a bluish tint. The brown colour disappears in the presence of ammonia (different in this respect to nitric acid).

Treatment: Administration of starch, white of egg, paste, magnesia milk.

Bromine and Bromide Compounds.—Symptoms: The same as with iodine, but the starch contents of the stomach are not turned blue.

Treatment: As in the case of iodine.

Alkalies.—Symptoms: Burning in the neck, choking, vomit often containing blood, and always of an alkaline character, purging, and violent pains.

Treatment: Administration of very dilute mineral water, of tartaric or citric acids, or of vinegar or lemon juice, oil emulsions in dilute acids.

Ammonia.—Symptoms: Similar to those given by alkalies, great secretion of saliva and mucus, affection of the respiratory organs, occasionally convulsions and cramp.

Treatment: As in the case of alkalies.

Copper Compounds.—Symptoms: Persistent disagreeable taste of copper, vomit of a green or bluish colour, colic, purging (often bloody and then black), tenesmus, headache, giddiness, cold, touching sense impaired, lameness.

Treatment: Vomiting and purging continued and facilitated, without, however, administration of oils; afterwards administration of white of egg, mixture of nine parts of fine iron filings with four parts flowers of sulphur, magnesia milk (two parts calcined magnesia, twelve parts powdered sugar, ten parts water and, if desired, addition of orange syrup).

Mercury Compounds.—Poisoning by means of mercury, as is the case with other metals, may be acute and chronic. The latter, which is particularly to be guarded against in breathing mercurial vapour, should not now occur among photographers, since the practice of Daguerreotype is no longer popular. It is with cases of acute poisoning by means of bichloride of mercury (corrosive sublimate) that we have especially to do.

Symptoms: A disagreeable metallic taste, burning in the throat, swelling and discolouration (whitish-grey) of the tongue and throat, choking, vomiting of a white and often bloody substance, purging with blood, tenesmus, cessation of urine, small pulse, syncope, defect in the touching sense of the skin, and total sinking of energy.

Treatment: Administration of drinks containing plenty of white of egg, or, if this is not at hand, milk or paste. At intervals, but only with advantage at the beginning, may be administered freshly precipitated sulphide of iron, or a mixture of seven parts of the finest iron filings and four parts flowers of sulphur mixed, or not, with honey.

Silver Compounds.—Symptoms: Similar to those given by copper poisoning, but occasionally with more violent nervous symptoms, giddiness, convulsions, &c. The membrane of the mouth is coloured white or grey, the vomit is white, but turns gradually grey or black on exposure to air.

Treatment: Application of emetics, then white of egg, solution of common salt (not too much of the last) to form insoluble albuminate and chloride of silver.

Gold Compounds.—Symptoms: A little fever and black discolouration of the teeth; secretion of saliva, and in the case of a patient having taken large quantities, the symptoms are the same as when soluble silver compounds are swallowed.

Treatment: Administration of white of egg in drinks, tannic acid, magnesia, milk (see copper compounds).

Lead Compounds.—Metallic taste, burning pains in the stomach, vomit of milk-white substances, colic, sometimes

*Photographisches Jahrbuch.

with stoppage, but occasionally with purging and secretion of saliva; often violent pains in the legs, lameness, giddiness, material diminution in the pulse action.

Treatment: Administration of emetics and purgatives, and especially of the sulphate salts, such as sulphate of zinc, bitter salts, Glauber's salts, and, at a pinch, white of egg, milk, and liquids containing tannin.

Zinc Compounds.—Symptoms: Powerful metallic and acrid taste, white colouration and wrinkled appearance of mucous membrane of the mouth, violent sickness, giddiness, coldness of the skin, convulsions.

Treatment: Administration of drinks containing white of egg, and of decoctions of tannin substances; also of alkaline carbonates and milk of magnesia.

Carbonic Acid.—Symptoms: Headache, giddiness, choking at the chest, diminution of muscular energy, loss of senses, languor, sinking of the pulse and respiratory organs, general paralysis.

Treatment: Plenty of fresh air, cold bath, warm foot-baths, and same treatment as in poisoning with carbonic oxide.

Carbonic Oxide and Coal Gas.—Symptoms: The same as those in the case of carbonic acid, and particularly giddiness, ringing in the ears, headache, fainting, loss of senses, paralysis, convulsions, sickness.

Treatment: Admission of fresh air to the system, blowing of the same into the lungs, artificial respiration, cold douches, vinegar clysters, friction of the hands upwards, smelling of ammonia, administration of strong coffee.

Cyanogen Compounds.—Symptoms: Cramp-like, laborious, and intermittent respiration, weakness, diminution of heart beats, loss of senses, absence of control over one's actions, convulsions, starting out of the eye-balls, which are immovable, dilation of the pupils, smell of prussic acid in the breath, at times secretion of saliva and foam in the mouth.

Treatment: Rapid clearing out of the stomach with stomach pump (emetics work too slowly as a rule); chlorine water, solution of one part of chloride of lime in forty-five parts of water with a few drops of hydrochloric acid; dilute ammonia in gum is usually without action, as well as mixtures and solutions of sulphate of iron and soda, or precipitated sulphide of iron and magnesia. To revive the nervous system, applications of cold water to the head and spine, while the patient is in a warm bed; artificial respiration; alcohol is also recommended.

Alcohol, Ether, and Chloroform Vapours.—Symptoms: These fall into three not very readily divided periods of various duration—namely, irritation, sinking, and paralysis. First of all, unsettlement of ideas, swimming of the eyes, vivid fancy images, broken talk, dreams, outbursts of rage, convulsions, sickness, then sleep, loss of senses, languor, general insensitiveness, dilation of the pupils of the eye, weak and slow pulse, peculiar respiration, but yet in deep breaths, diminution of bodily heat, and finally cessation of action of the heart and breathing, cold, clammy perspiration and syncope.

Treatment: Sprinkling with cold water, rubbing, introduction of fresh air into the lungs, artificial respiration, electric treatment, administration of seltzer water and plenty of cold water.

THE STEREOSCOPE.

We are indebted to the late Sir Charles Wheatstone for a series of investigations on binocular vision, which finally culminated in the invention of that now very popular little apparatus, the stereoscope. It was in 1823 that Wheatstone called attention to a fact until then hardly noticed, namely, that the perception of relief in objects is the result of the superposition of the images, one on each eye; but the images slightly differ from each other. The mind, guided by the experience of many years, receives in this way the impression of various distances; and Wheatstone discovered that this impression may also be given to the mind by two

pictures, if each is drawn so as to correspond, respectively, to the image received by each eye. In order to prove this, Wheatstone invented the stereoscope. Considered from the standpoint of pure science (apart from its practical application for amusement, instruction, and research, and the binocular microscopes and telescopes that have grown out of it), this discovery of Wheatstone's is, perhaps, as interesting as any other invention of recent date, not excepting the kaleidoscope, the telephone, the pseudoscope, and the revolving mirror for measuring the velocity of light, &c. Sir David Brewster, who was erroneously supposed by many to have invented the stereoscope, used often, while insisting on the importance of this new conquest in physical science, to describe this instrument unhesitatingly as the most remarkable gift with which the study of binocular vision had been enriched.

The first stereoscope by which Wheatstone demonstrated his discovery was a reflecting stereoscope. Two vertical mirrors were placed so as to make, respectively, an angle of 45° with the axes of the eyes, and in such a position as to reflect the rays coming from the right and left into the eyes, the mirrors being joined at a middle point between the axes. Two perspective drawings, correctly made, so as to correspond with the image which the real object would make in each eye, were then so placed, at the right and left, as to cause these images in the mirrors to coincide in the act of vision, and the illusion was perfect. Wheatstone found later that he could dispense with the mirrors and simplify the apparatus by using two prisms, to which he had lenses attached so as to magnify the drawings. Brewster finally had prismatic lenses made, joined by their thinnest edges, by which small drawings, placed at the distance of, say, three inches, could be made to coincide for the vision. It should, however, be mentioned that Duboscq, of Paris, was the first to give to the stereoscope the simple practical form in which it is now seen in the trade; but its popularity did not become established until photography came to its aid, to make binocular pictures perfect in all their details.

It was at the first universal exposition in London, in 1851, that Duboscq exhibited a stereoscope, and then, for the first time, the instrument became noticed by the public although it had been known to scientists for thirteen years during which time Dr. Carpenter and others had continually, in lectures on physical sciences, exhibited the instrument and demonstrated the principles of Wheatstone's discovery. According to the statements of one manufacturer of optical instruments, a long time elapsed before the people began to appreciate the beauties of the stereoscope; and for several years no sales of any importance could be made. But at last its merits were realized, and suddenly a large demand sprang up. The stereoscope soon became in fashion, and the manufacture of the different forms of the instrument (varying in price from 50 cents to 100 dollars), the grinding of the prismatic lenses, and the production of the photographic pictures on paper and on glass, have now become an important branch of business, in which thousands of artists and workmen are occupied.

A recent application of the stereoscope, especially useful for the student of science, consists in the reproduction of drawings of geometrical figures, illustrating the various forms used in the study of stereometry, such as the projection of solids in descriptive geometry and spherical trigonometry, and especially in crystallography. In the latter science, it may be made especially useful, as, in this way, not only the crystals themselves, but also the forms resulting from the interpenetration of two crystals, may be explained better than can be done in any other way. The relation of various systems of crystallization, the transition of one form into another, the relation of the nucleus to exterior forms, the directions of cleavage, the position of axes of crystallization, the laws of double refraction, and various other more or less intricate subjects, may thus be made simple to the average understanding; and these studies may awaken some interest in this important subject, and simplify it to those who cannot afford to buy the

expensive and bulky models of crystals. A number of stereoscopic pictures may thus be made equivalent to a collection of models costing as many dollars as the pictures cost cents.—*Scientific American*.

HOW TO PRINT IN CARBON.*

BY C. GENAILE.

I suppose you have the materials on hand, and your negative ready. Take a piece of the tissue, about two feet, and steep it in a solution of bichromate of potassium, one ounce to forty of pure water; make up three ounces of bichromate and one hundred and twenty of water, which can be used three or four times; put it into a tin dish, or anything; roll your tissue backwards and forwards in it until you get it to lay smooth; leave it in two minutes, and pull it out over the dish, and hang it up to dry; while in this wet state it is not sensitive to light, and can be done in daylight. I prepare it in the evening a little before dark. Be careful to have no dust or bad odors about where you dry and keep your tissue. It takes several hours to dry, and cannot be dried by the fire; the room must have dry atmosphere in it. When dry, or nearly so, it is very sensitive, and must be kept in the dark or yellow light in a tin box. It is most sensitive when the weather is a little damp.

The negative that you print from must always have yellow or black paper around the edge, so that the light does not touch the edge of the tissue printed on. As you see nothing on the tissue when printed, you use the photometer with the little numbers on it, and put a small slip of silvered paper according to the instructions you have received, and print to between three and four visible; make a few trials and develop, and you will soon find out the right time. It varies according to the strength of the negative, and the state of dryness of the tissue, which is one of the most important things to study so as to regulate your time. It requires patience to learn.

When printed, put your tissue in cold water, but first prepare a porcelain plate of polished glass the size, or a little larger than your tissue print; rub some of the wax solution on the plate, then coat it with plain collodion, which, when set, immerse in cold water till the water runs smoothly over the plate; then take your tissue print which is in the water and lay it on your collodionised plate which has water on it, so that you can more easily move your print into its right place; put it on a flat table or board, lay your rubber cloth on, and pass the squeegee over it gently, which drives off the water and any air-bubbles; leave it for ten or twelve minutes under a flat-iron, or any weight, with a piece of blotting paper under, then put it in a dish of pretty warm water, and when you see it commence to turn black all around the edges, which it does in five or six minutes, or often much less, you can take hold of the paper by one corner, and very gently turn it back; do not let it slide, but lift carefully, which paper you throw away. The tissue is then on your white porcelain, and if you gently throw warm water with one hand on it, the picture will develop by itself beautifully and gradually till it is fully out; if too light, you will know you must print it more, or, if too dark, less. When properly developed, pour a concentrated solution of alum over it to harden it, then wash for a minute under a tap of clean, cold water, and put it in your rack to dry. When dry, touch out any spots with lead pencil, looking through by transmitted light at the time of working on it, so as to get the right tint; then cut out a piece of transfer paper the size of your print, put it in a solution of warm water, and lay the slippery side on your carbon tissue; put the rubber cloth on and squeegee as you did the first time to drive off bubbles and water. Leave it to dry, then pull it off; you cut and mount the same as the other prints, and burnish; practice, and have patience till you succeed, and you will be happy. Read carefully Lambert's

* *Practical Photographer*.

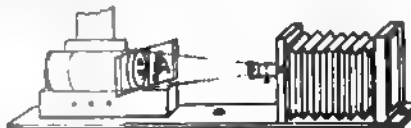
instructions after you have worked at it, and you will understand them better then. You cannot use too much care, cleanliness, and patience.

NEGATIVE ENLARGEMENTS,

WITHOUT PIGMENT DIAPOSITIVES, BY MEANS OF COLLODION AND THE SCIOPTICON.

BY VON KOLKOW.

It is very well known that diapositives prepared by means of collodion are always hard, and lately there are pigment positives which are very highly recommended. I myself give the latter a preference, on account of their easy preparation for the production of enlarged negatives, because they are very fine and transparent. But to him who has no good, clear, and very fine prepared pigment paper, or who is not a proficient in the pigment process, in order to prepare a suitable and rightly exposed pigment picture for enlargement, I recommend very much a collodion positive, with his common portrait collodion thinned with two-thirds of an equal mixture of alcohol and ether. These diapositives, when developed, look very faint, but show all the details, and are very fine and transparent, like pigment pictures. On cloudy winter days, when it is very difficult for photographers to execute large plate directly on account of long exposures, it is very easy to make a carte-de-visite. This varnished negative, which should not be too much strengthened, but nearly over-exposed and presenting full details, must be copied by means of the sciopticon, in order to receive a diapositive of it.



In a dark room, or towards evening, I put the sciopticon on a suitable long board (a), remove the objective and the slide of the same, and fasten in front of the condensing lens (b), the negative (collodion side in front), and opposite the common camera (c), the objective of which must be of equal height with the condensing lens of the sciopticon, diaphragm down two-thirds, and make an equally large diapositive (behind the condensing lens, the back-glass of the lantern must be replaced by a fine ground-glass, not white opaque-glass); the right exposure is soon found, generally in from fifteen to twenty seconds. This diapositive is to be fixed, and, without varnishing it, to be fastened again in place of the negative in front of the sciopticon; after that again prepare, in the camera, negatives of all required sizes. Plates of fifty by sixty centimetres I prepare in one to three minutes, according to the size of stop used in the objective.

These negatives may, as you choose, be strengthened, fixed, and afterwards retouched in the common way. They are just as fine as taken from pigment positives, and give excellent copies on albumen paper, which can hardly be distinguished from those of directly taken large negatives. For taking the positives and the enlargements, the developer ought to be very weak; in order to get a fine precipitate, the common developer must be diluted with one or two parts of water. For the positive we have to look out that the same will be rich in details and transparent, and this can only be done with the sciopticon, which is indispensable; we have always the same light to work equally, and produce better enlarged negatives than by daylight; for negatives, which must be equally sharp in all parts, I take the landscape lens of a stereoscope double objective, or an Orthoscope Voigtlander No. 1. For half-length pictures the portrait objective is sufficient.

In no case do I reject the fine and beautiful pigment diapositives; but I desire to show those who are not acquainted with the pigment process how to produce just as good and fine negatives in this season, and also in the evening, by means of the sciopticon and collodion positive.—*Photographic Times*.

The Photographic News.

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TUITION IN CARBON PRINTING.

BELIEVING that carbon printing will eventually become universal, and that every portrait photographer must ere long be able to meet the demand from the public, who will assuredly require permanent prints as knowledge on the subject becomes popularized, we look with great interest on all projects for efficiently teaching the process. And although, as technical journalists, we aim to give all the information possible in relation to the art we represent, we feel no jealousy of any other efficient means of imparting information. In fact, we may say frankly that whilst facility in carbon printing may be "picked up" solely by aid of the information which has appeared in our columns, and considerable experiment, it may be more readily and completely acquired by aid of tuition by a competent teacher, and we are heartily glad that facilities for obtaining lessons are increasing.

One of the primary qualifications in a teacher is personal skill. A man should himself be able to produce good work before he can teach another how to produce good work. It is possible, indeed, for a comparatively unskilled man to teach, and, by "teaching others, learn, himself, to spell!" But it is natural that the intending pupil should look for some credentials of the fitness of his tutor. And in the absence of an authoritative diploma the evidences of practical skill in the shape of good work, afford the best ground of confidence in the fitness and capacity of the instructor. We have pleasure in calling attention to the project of giving lessons to photographers generally of another gentleman of the highest ability, not only as a carbon worker, but as a portraitist generally. Mr. E. Greaves, of Halifax, is known by his work to many photographers. At the Photographic Exhibition held in London nearly two years ago Mr. Greaves exhibited a frame of portraits which were regarded by capable artists as the gems of the exhibition. They were in a bad position, near the floor, but were not overlooked by those who sought out neglected excellence. These were sufficient guarantee of the ability of the portraitist. Of the carbon printer we can speak, from examination of his work, in the highest terms. Every one of his prints we have seen are of the highest quality. It will be seen, moreover, from his announcement, that Mr. Greaves has a special system and special appliances for managing his printing with the greatest certainty, rapidity, and economy. And we have pleasure in commending attention to his project.

It also affords us satisfaction to call attention to the latest arrangements of the Autotype Company, as announced in our business pages. Arrangements for systematic tuition are established at Ealing, and lessons are available to non-licenceses and licenceses alike. We feel

satisfied that no course is so well fitted to secure new licenceses, as affording them demonstration of the simplicity, certainty, and generally satisfactory character of carbon printing. There is another item in the recent announcement of the Company to which we have especial pleasure in calling attention. One of the arguments which have been used by the opponents of patents has been the assertion that the existence of a patent is repressive of improvement, inasmuch as, it is alleged, experimentalists have little inducement to attempt improvements when they know that all that may be done in this direction will be absorbed by the patentees, who will gain the advantage, instead of the result being reaped by the experimentalist, or the community at large. The announcement to which we refer completely cuts away the ground for an argument like this in the present instance. The Autotype Company have been most praiseworthily liberal in their general arrangements, and in the announcement we have mentioned they perform a special act of grace. They announce that to all photographers who have been working their processes, and thus practically helping to solve the difficulties which beset the early paths of permanent photography, the Company will grant an Autotype licence on payment of the costs of stamp and registration. This is wise and well: and it will, we doubt not, have a beneficial influence on the general progress of permanent printing.

THE ELECTRIC LIGHT IN THE STUDIO AGAIN.

AS many of our readers know very well, the electric light has already received application by the photographer, who has endeavoured, by its aid, to make himself independent of the sun. The Woodbury Photo-Relief Printing Company, M. Disderi, and M.M. Goupil, of Paris, have, in turn, all employed the electric spark to aid them in their work; but have found, one after another, that this mode of illumination is at present hardly suited to their purpose. It is expensive to produce and to maintain, and, furthermore, its capacity is exceedingly limited compared to bright sunlight.

During the past twelvemonth, rapid strides have been made in the matter of electric illumination in Paris, the Gramol machine, a powerful magneto-electric apparatus, being used to generate the light. The *Chemins de Fer du Nord* station in Paris, and some large factories at Lyons, have been lighted up with electricity by the assistance of this machine, and so promising have been recent experiments that a much wider application of this method of lighting is spoken of. As our Paris Correspondent, M. Lacan, has pointed out, there is now more hope than ever of a universal employment of electricity for industrial purposes, since a simple mode has been devised of generating the light. According to our correspondent, M. Denayrouse is in possession of an easy and certain method of supplying electric illumination, which will revolutionise all existent apparatus. A constant and never-failing source of light is provided, and in such a manner as to present little difficulty to its use in everyday life.

So far as we can understand, M. Denayrouse employs for the purpose a compressed cake of earth, or rather kaolin, a substance well known to photographers. Running through the centre of this compressed mass is a material (we are not told what) which has a high conducting power, and which, at the same time, emits heat to such an enormous extent as to raise the surrounding kaolin to a high temperature. The cake of kaolin, indeed, becomes a bright and glowing mass, and in this condition is, in its turn, a conductor of electricity. So that after the preparation of the kaolin cake, it suffices only to pass an electric current through the centre, and maintain this current, in order to secure a constant light of exceeding brightness.

Should this method turn out to be really feasible, the problem of electric illumination will have been solved, and there is no reason why the idea of the inventor should not

be carried out, which is to have lamps of this nature in our streets, which would thus be lighted with electricity. There would be little trouble, doubtless, in distributing electric currents in all directions, and we should have a far brighter illumination than the rows of feeble yellow gas jets now afford. The lamps might be placed at a greater height, and in this way their influence would be felt at a greater distance.

Already this new source of electricity has attracted the attention of photographers, and Mr. Vander Weyde, we hear, is in treaty with the inventor respecting it. No doubt an easy and inexpensive method of lighting the studio with electricity would readily be taken up by photographers, for not only would it render them independent of the sun in winter time, but it would enable them also to take portraits in the evening as well as in the morning. And this, in the case of ladies who desire to be depicted in their dinner or evening dresses, is a matter of no little importance. Photographers, for instance, who could secure portraits of ladies, calling at the studio, on their way to a dinner-party or the opera, would not lack customers; and it is very probable that the electric light, suitably applied, may be made use of in this and other directions.

BICHROMATE OF POTASSIUM.

Blood Poisoned by Absorption of its Solution through the Pores.

BY J. D. COLTON.

Now that the subject of carbon printing is being so fully discussed, it may be interesting to those engaged, or about to engage, in the work, to read some experiences in poisoning with bichromate of potassium taken into the system through the pores of the skin by immersing the hands in its solution. It has not only been my misfortune to have suffered the greatest agony for weeks together, barely escaping death, but I have had the opportunity of carefully noting all the effects of such poisoning upon others as well as my own constitution. Such extreme cases are, I grant, of but seldom occurrence; but as all systems are liable to the action of the poison to some extent, the subject is well worthy of attention. The effects of the poison when swallowed are quite different from those of which I am writing, and as there is an abundance of information upon the former subject in print, I will confine myself to the blood poisoning simply.

The first symptoms of local poisoning are heat, itching, and tingling upon the ends and middle joints of the fingers, which, when examined, are found to be covered with small irregular red patches, upon which are numerous small elevations clustered together. In the course of a day or so these enlarge to the size of small beads, and are filled with a limpid fluid. In a short time these clusters run into each other, forming large blisters, which dry and crack, causing the most acute pain and itching. At this stage pustules begin to form all over the body, mainly down the spine, on the neck, left side, arms, and ankles, accompanied with considerable constitutional affliction, such as sickness, headache, thirst, fever, sleeplessness, and loss of appetite and senses. In my own case, after the third day I became nearly blind, the whole mucous membrane became inflamed, running and pain in the ears and throat. One case came to my notice in which the patient was covered with large patches which had all the appearance of having been eaten in with strong acid. This patient lost his appetite completely, and suffered much pain in the intestines and bladder. He lost consciousness every few hours, and had to be continually watched and aroused. When apparently insensible, he was so dejected in spirits that he endeavoured several times to commit suicide.

The effect of this poisoning upon scrofulous and syphilitic persons, when it does affect them, assumes a very troublesome and dangerous form, though strange it is

these persons are not so susceptible as healthy ones. The treatment—perhaps owing to the seldom occurrence—does not appear to be well understood. I sought advice from many able physicians abroad, but there seemed to be no reliable remedy but to allow nature to take her course, aiding the cure by paying strict attention to diet and habits. The following treatment I have found very successful in every case:—

Abstain from drinking beer, spirits, or coffee, and eat no potatoes, brown meat, salt fish, or sugar. Take plenty of exercise and fresh air. Avoid tobacco.

Take one teaspoonful liquor potassæ in a teacupful of barley water three times daily, before meals, for five or six days, after which take three times daily—

Tinctura serpentaria...	...	1 fluid drachm
Tinctura opii...	...	5 minims

The parts ulcerated and inflamed must be bathed frequently for several days, with

Liquoris plumbi subacetatis diluti... quant. suff.

The above treatment is continued until the sickness and pain have subsided, and the patches have lost the fluid they contained, and begin to heal; the hand, arms, &c., are then bound with unguentum resinos, and the following is taken for about ten or twelve days:—

Ferri et ammon. citr.	...	2 fluid drachms
Ammonium bromide	...	1 ounce
Potassium iodide	...	2 fluid drachms
Mist. camphora	...	12 ounces

Take one ounce twice daily, and following pills, two each night:

Extr. cannab. ind.	...	½ grain each
To make twenty-four pills.		

In my own case I found the free use of fresh butter advantageous, but as I have never tried it in other cases I cannot recommend it.

It is generally believed that by washing the hands in ammonia after sensitising, or using bichromate in any way, it prevents the poison from entering the system, by neutralising the acid; but this is quite a mistake, and a solution of bichromate rendered perfectly alkaline with ammonia poisons quicker, if anything, than an acid or neutral solution.

In conclusion, I trust I have not occupied so much valuable space to no purpose. This is a matter of the greatest importance to carbon workers, and this being the first mention I have seen made of so serious a drawback to the use of bichromate, I hope my remarks may elicit further information from those who have had experience in this direction.

THE CARBON PROCESS OF TO-DAY.

BY W. E. BATHO.

THAT there is a growing interest in the carbon process is patent to all who observe the signs of the times. That the interest will bring about the general adoption of this method of printing to the exclusion of "silver" is not certain; let those who like cry, "Carbon shall be king!" Any disinterested party can plainly see each system has advantages peculiarly its own. Certainly a skilful silver printer can do things no carbon printer can approach, notwithstanding all boasting. It has been well and truly observed, that were the same care and skill bestowed upon silver printing that is given to carbon, many of the complaints made against the former would be shown unjust. But the world loves change: the favourite of yesterday, to-day is led to the guillotine. A certain photographer once wrote:—

"When smiling fortune sheds her golden ray,
All crowd around to flatter and obey;
But when she hides behind a cloudy sky,
Our friends, our flatterers, and our lovers fly."

Let us write the epitaph on silver printing: "Henceforth our works shall be permanent," and posterity will possibly

utilise them for purposes foreign to our intentions. Well, well may they enjoy such Vandalism; it will not

"— vex thee, lying underground."

But to the story, to the story.

The pigmented tissues, as issued to the profession, all are more more or less familiar with. The carbon process only exists because of the permanency it promises. Clearly this must depend upon two things: first, the endurance of the gelatine, rendered insoluble by the agency of light; and, secondly, upon the permanence of the pigment imprisoned in such gelatinous film. That the latter has given some persons reason to doubt the lasting qualities is instanced by the letters appearing at times in the pages devoted to the furtherance of our art. Yet the clearest evidence on this point would only indicate an error in the selection of a pigment, and not a defect inherent in the process. But any proof given that the insoluble film holding the pigment is liable to any change, ending in dissolution with what may be termed ordinary wear and tear, would at once stamp the process as one brought under our notice with false representations.

The sensitizing of the tissue involves so many considerations that will account for some of the vagaries unjustly attributed to the manufacture of the material, that a little attention may not be time mispent.

If a piece of tissue be plunged beneath the surface of water contained in a tall glass vessel (simply to facilitate observation), the familiar appearance of a solution of greater density mixing with a lesser one will be seen to take place when the compound gelatine film is in contact with the water. The same phenomenon will also take place if bichromate solution be substituted for the water. Some of the sugar in the tissue is dissolved out, and hence a sensitizing bath must rapidly become contaminated with organic matter, to the injury of tissue subsequently sensitized therein. A reaction, having some similarity, takes place when the oxalate of iron, used in Mr. Willis's platinum process, is either made or exposed in daylight—that is, a decomposition of the sensitizing agent is brought about before exposure takes place—in the carbon process, a want of purity in the whites is the result; in the platinum-type, stains all over the surface of the paper are produced. Another circumstance, having a close connection with the sensitizing of tissue, must be noticed—that is, the variety in gelatine, as shown by the difference in the quantity of water different samples absorb in the cold. It needs but little exercise of the reasoning powers to perceive that of two samples of tissue, alike in every respect save one, and that a difference in absorption, such would, were it sensitized in the same bath, show a corresponding dissimilarity in sensibility; and practice proves the reasoning correct. Such discrepancy can also be brought about in a much simpler way, and one far more likely to plague the practical photographer. If tissue under different hygrometric conditions be immersed in the sensitizing bath, and kept therein until the usual sign of sufficient immersion is obtained (*viz.*, the tissue becomes flat), that sample which previously contained the most moisture (other conditions being alike) will have the least proportion of bichromate therein, and, hence, occasion diminished sensitiveness. Having seen tissue sensitized when "bone dry," and, again, in such a state as to be decidedly tacky, this last observation seems to me not an unnecessary one.

To sum up. In producing uniformity in the tissue, so far as sensibility is concerned, first an uniform quality of gelatine is required, which may be left to the manufacturer; second, a constant degree of moisture in the tissue; third, fresh solution each time of sensitizing; fourth, if the squeegee be used to remove part of the sensitizing bath from the prepared sheets, in order to facilitate drying, a regular and constant pressure must be used. Some of these precautions may be thought too precise;

each, however, is welcome to his opinion. No doubt there are individuals who succeed, no matter if they work with a saturated bichromate bath, or one having .0001 per cent. I am not so fortunate, but I must follow the tissue to the finished print.

(To be continued.)

PHOTO-COLLOTYPE PRINTING.

BY M. T. H. VOIGT.*

WITH the bichromated albumen of Obernetter it is advantageous to employ a first film less thick. To arrive at this result, there is poured upon the plate a sufficient quantity of the solution, and this is dried on a stove at a temperature of 15° to 20° R. If you proceed to a higher temperature, the film easily lifts; therefore, it is necessary to follow exactly the instructions here laid down. For the same reason the plates must not be withdrawn from the stove until they are quite dry. Very often tiny fissures are produced in the first film, but these are of little importance. Once dry, the plates are placed upon black velvet, and exposed to light from the back. During the summer the exposure should last from fifteen to twenty minutes, or in less intense light thirty minutes or even more are necessary, while in the winter an hour or an hour and a half is required. Before applying the second film, the plates are plunged into water warmed to 40° to 45° R. Herein they are left for some minutes, until the film has softened. During their sojourn in the water the surface is rubbed with the end of the finger, so as to remove any dust that may have become attached.

The softened film is rinsed in warm water, and then the second film is formed by pouring upon the middle of the plate the mixture given below, the same being permitted to run successively toward each angle, to chase away the water upon the plate. This second film is dried by means of a stove heated to 40° R.

Second film.

1st.—Gelatine ...	...	90 grammes
Water ...	...	720 "
2nd.—Isinglass ...	...	50 "
Water ...	...	480 "
3rd.—Bichromate of potash ...	...	15 "
Bichromate of ammonia ...	...	15 "
Water ...	...	300 "

A new simplification has been imported into photo-collotype printing by the use of soluble glass (alkaline silicate), which avoids the isolation of the first film, and its washing in warm water. The mixture for the first film is prepared by beating albumen into froth, and adding soluble glass and water; you beat again and filter through linen. Here are the proportions:—

Albumen ...	...	25 grammes
Water ...	...	45 "
Silicate of soda... ..	...	6 "

The solution is poured upon the plate like collodion, and allowed to dry spontaneously. This done, you wash in a bath of water, rinse, and finally dry, after which you can at once proceed to the application of the second film.

Another way of employing the alkaline silicate as a first film consists in pouring a solution of soluble glass upon a plate, and allowing it to dry; afterwards the silicate is rendered insoluble by plunging it for a minute or two in a solution of nitrate of baryta. The plate is withdrawn, washed carefully with pure water, and then the application of the second film is proceeded with, which is composed of:—

Gelatine ...	...	5 grammes
Isinglass ...	...	3 "
Bichromate of ammonia ...	...	2 "
Water ...	...	70 "

To avoid air-bubbles, the mixture must be poured with

* Continued from page 202.

considerable care, and extended with foresight upon the film of soluble glass. A large wet brush or a bit of blotting-paper will aid materially in the operation.

The majority of the fissures that are to be seen upon the plates are due to impurities in the substances employed, and especially to the isinglass and gelatine. As the former contains particles of grease difficult of removal, it may be dispensed with, and all inconvenience avoided by employing only purified gelatine. This latter is rendered pure by being cut up into small fragments and put into cold water, the water being frequently renewed, until a solution of oxalate of ammonia (one part of salt in twenty-five of water) produces no precipitate in the washings.

A few drops of ammonia are then added to the white of an egg, and the latter beaten to a froth. You continue to beat, adding the gelatine which has been dissolved by a mild heat, the white of one egg sufficing for 2-50 grammes of gelatine. Then two or three drops of acetic acid are added. With a glass rod the liquid is stirred until it is thoroughly mixed, and it is then boiled and filtered. The viscid mass is allowed to stand, during the night, in a dialyser, in water, so as to remove every trace of acid. Finally, the gelatine is dried, in the open air, at a temperature of from 15° to 18° R.

As a supplement to the processes which I have just described, I will detail the *modus operandi* modified by myself, as also the particulars of a drying box of my own invention, both of which are to be recommended by reason of their simple nature.

I employ a film of pure soluble silica, which will only keep good a day or two. A very slight thickness suffices to produce the adherence of the second film with the plate. To secure this, I pass over the surface slowly and uniformly—so as to prevent the formation of any air-bubbles—a broad and soft camel's hair pencil impregnated with soluble silica. This is applied to the glass plate after it has been ground, and the film is allowed to dry. By operating in this manner the white of one egg will suffice for a large number of plates.

I do not wash the plates in water before the following treatment:—I place upon a table a zinc vessel, and give the same a perfectly horizontal position by means of a screw tripod and a water level. The gelatine destined to furnish the second film must neither contain sulphur nor acid, gelatine of this sort being friable and easy to remove from the plate during printing. Neither must it be partly soluble in cold water, because it then furnishes inferior impressions.

When choice has been made of a good gelatine, it is necessary to employ the undermentioned method of purification:—140 or 150 grammes of gelatine are put into 1200 grammes of water; the latter is changed several times during an interval of several hours, having care to replace the quantity that is removed. This treatment having continued for some time, the gelatine is dissolved by mildly heating it; the white of an egg, beaten to a froth, is added, and the whole is well beaten up to mix it. The vessel is then put upon a sharp fire, and brought rapidly to the boiling point, having a care to stir it up continually to prevent the gelatine sticking to the bottom of the vessel.

As soon as the liquid begins to boil, it is allowed to cool, and is then filtered through a flannel. Although somewhat grey to begin with, the liquid soon becomes clear and transparent.

To filter the gelatine I make use of an apparatus which permits me to preserve an even temperature during the whole course of the operation. I have a vessel of tin in the form of a funnel, between the walls of which is introduced some warm water by means of an opening therein. A funnel is put inside, and the filtering operation goes on. The liquid is thus surrounded on all sides with warm water. The apparatus is set in action, and you have merely to place underneath suitable vessels to receive the filtered liquid.

In the next place I prepare the following solution:

Bichromate of potash...	20 grammes
Bichromate of ammonia...	10 "
Water ...	300 "

This is mixed with the gelatine, which is now ready for the second film. I pour upon a plate placed in a perfectly horizontal position a sufficient quantity of this mixture, and spread it by means of a piece of filter paper. If there is any tendency to escape at the side the latter must be rubbed with the finger. The superfluous liquid is then permitted to escape into the vessel to be employed later, and the plate is put into the drying-box. In order to operate always under the same conditions, and avoid irregularities in the surface, it is well, especially in winter, to maintain an even temperature in the laboratory—say that of 18° Reaumur, for example—and to arrange matters so that while it is employed the gelatine is maintained at a temperature of 35° R., for otherwise it will thicken, and then it is impossible to spread it evenly.

In order to keep the gelatine warm, use should be made of a rather deep saucepan in which is placed an iron support capable of carrying the vessel containing the bichromated gelatine. Enough water is put into the saucepan to reach the bottom of the gelatine vessel. At the level of the water is placed a bent thermometer, which enables one to read off the temperature outside the saucepan. The last is then covered, placed over a petroleum lamp, or a gas jet, and I heat until the thermometer indicates 35° to 40° R.

The upper portion of the gelatine is often filled, after filtration, with a quantity of air-bubbles occupying a thickness of several centimetres. Here is one cause of inequality in the film, and for this reason it is well to make use of a vessel for the gelatine which has a tube at the lower part (like the spout of a coffee-pot). In this way the lower layer of gelatine in the vessel only is employed, which is exempt from air-bubbles.

(To be continued.)

PHOTOGRAPHY IN THE TROPICS.

BY M. PAUL LEVY*

THE difficulties which beset the inexperienced photographer in the tropics are pretty well known. The chemicals behave in a totally different manner to what they do in Europe, and their reactions and results are by no means uniform. During my voyage to Nicaragua, I have gathered some experiences, some of which were acquired previously in Mexico and upon the African coast, and these I find to be in accordance with the views of M. Ramon de Espinola, a chemist and photographer of Granada.

Here they are in the form of notes:

Do not carry out with you any utensils of gutta-percha; they melt. For the sensitizing bath, whether vertical or horizontal, it is preferable to employ a vessel of glass covered with straw or rushes, and placed in a special box of wood. For other baths it is best to have papier-maché varnished. For if gutta-percha is to be rejected, it is also well to have as little glass as possible, because of the risk of transit across the country.

Again, there should be few glued articles among your apparatus; this should be screwed or dove-tailed together. In a warm climate the humidity and moisture separate all glued surfaces.

Have everything exceptionally stout and solid, so as to resist sudden shocks. Have the feet of instruments furnished with a framework or bag of stout canvas, to be suspended underneath the apparatus full of stones, so as to steady it in a gale of wind. If a dark-tent or closet form part of the apparatus, it must be borne in mind not to place the same in full sunlight, as it is then impossible to work therein; nevertheless, by making the covering very

* Communicated to the French Geographical Society.

thick, a double thickness of black inside, with a cover of shining white, a serviceable tent may be secured. On the African coast, I had a structure made of dense foliage, under which I erected a tent of ordinary construction.

It must be remembered that a ray of light penetrating the dark room does far more mischief here than under ordinary circumstances.

You must never operate between the hours of eleven and two. The pictures obtained during this interval are detestable; the rays of light are too vertical, and the whites too glaring.

As few objects as possible should be of iron, because of their extreme liability to rust; everything should be of copper, brass, or galvanized iron.

Doublet lenses for portraits or lenses should be rejected. You should have a simple lens for landscapes, or another separate one for portraits or groups, if thought necessary. In photography applied to topography, or large work, it must be borne in mind that a lens giving straight lines must be employed.

Very small diaphragms must be used even when the exposure has to be prolonged; there is always too much light, not enough repose, lack of sharpness in the outlines, and absence of detail.

The waxed paper process gives good results, and may be conveniently employed with the portable dark slide of Marion; but the exposure—already a long one in Europe—required is more lengthy still here, where very small diaphragms must be employed.

The dry collodion process has given me but very so-so results in the tropics. This may be by reason of inexperience on my part. It must be remembered that neither glass nor diamonds to cut it are to be had under most circumstances.

As regards the collodion, I would remind the reader that the heat has a very energetic action upon the ether. After many trials I at last decided the following *modus operandi* to be best. I received my collodion from Europe with the iodiser separate. I employed the bromide and iodide of cadmium, the iodide of ammonium, and that of potassium. As the solution is always of a capricious nature, according to the state of the atmosphere, the electric tension, pressure, temperature, &c., I divide it into a series of numbered bottles, into which I put the bromide and iodide alternately in excess, so as to be able to employ the one or the other as I may desire. In this way I can control, to a certain extent, the time of pose according as I have a portrait or landscape to take. I have two graduated vessels, or collodion pourers, into which, at the moment of collodionising a plate, I introduce a sufficient quantity of normal collodion, and mix with it a suitable dose of the iodiser; I stir with a glass rod, allow the liquid to stand for a moment, and then coat my plate.

You must not prepare your own pyroxilin in the tropics; let it come to you from Europe, and send your order a long time in advance, for such goods are very slow in transit. Do not send your albumenized paper with chemicals, nor liquids with solids. It is well to divide one's packages into small parcels or boxes, so as to be carried by mules, the boxes being long rather than high or wide, and not more than one hundred pounds each, twice this amount being the burden of one mule. Everything should be in duplicate.

For the sensitizing bath employ recrystallized nitrate of silver as pure as possible; for sensitizing paper, the ordinary nitrate will do.

Always cover up your baths when in use. From the tiny moths who come flying around your light, to the bats who have the weakness of misbehaving themselves in the presence of acetic acid, there are many things to injure your solutions.

Glass rods should invariably be employed when possible. The fingers emit too much perspiration to be used with impunity. If you perspire much from the forehead, wear a

turban, for a drop of perspiration falling upon a plate or into the bath must injure them.

Develop with iron, and intensify with pyrogallie acid; fix with hyposulphate of soda, and have nothing to do with cyanide.

The clichés should be carefully varnished, and very promptly, for the films are very liable to split. The ferro-prussiate paper of Marion may be frequently employed, and is economical. Waxed albumenized paper is soon destroyed. Paper should be received frequently in small canisters surrounded by chloride of calcium.

As to distilled water, that is a grave question. There is none to be had. The photographer should carry a small still for making his dipping bath, at any rate. Rain-water is in general use, which is saved for the dry season; it is treated with nitrate of silver to precipitate any salts in suspension, and is then filtered. But the result is always unsatisfactory, for, take whatever precautions you may, the water always contains some organic matter and noxious gas, which have an injurious influence.

COPYING NEGATIVES.

BY H. M. BRILES.*

AT various times and in various journals have been published very full descriptions of how to obtain first-class enlargements from negatives already in the hands of the artist. For this the fraternity ought to be very thankful. It is not, however, with the process of first obtaining a glass positive, and then from that a negative, that I am now to deal, but with such cases as cannot by any means come under such a process. Having within the last three years made thousands of enlargements, and having had, in nearly every case, to work from some old picture—frequently one much faded, sometimes all covered with scratches, but oftener dim and dirty—I have found that a great deal of ingenuity, much skill, and great care are required to produce, from such a picture, a pleasing enlargement; nor will I say that it can always be done, since frequently the artist has but the faintest shadow of a picture to work from.

Of course, a suitable lens, copying-box, cones of various lengths, and copying board are required. Use any good quarter-tube supplied with central stops. A small stop will be needed in copying groups and large heads. Place your board in good strong light (I prefer sunlight—direct, if it can be had, without even glass between); sensitize a plate the size of the negative desired, and remember that in this operation an old red, but good, structureless collodion is by far the best. Fix the picture to the board, focus, and expose plate precisely as you would for a life picture, except that you will find it more convenient to copy the picture head-down, as you can focus more easily, and, I apprehend, more accurately. The matter of exposure is the vital one in copying. An over-exposure will flatten the copy, and so spoil it; an under-exposure will be at the expense of detail. The shortest exposure which will faithfully render the detail will be the best. In life-work redevelopment or intensification should be the exception; but in copying it is imperatively required in nine cases out of ten; and it certainly requires good judgment to decide when the operation is complete.

After development, wash well, and strengthen with pyro. and silver. If you fail to obtain sufficient intensity, wash well and fix; then wash again, and again apply the pyro. If you had not sufficiently washed your plate after fixing, you will have ugly-looking markings. Do not be alarmed, however. Wash well again, and now flow the plate with a solution of bichloride of mercury (corrosive sublimate), when the markings will begin at once to grow fainter, and the process of intensification will go rapidly on. With the bichloride solution you may carry on the intensification, if desired, until the plate becomes white again, and

* Practical Photographer.

then, if still weak, you may wash well and flow with a solution of water to which a little water am. has been added, when the plate will again become black and several degrees more intense. Retouch your negative as carefully as possible, ever bearing in mind that if a thing is worth well doing, now is the time.

Bad backgrounds may be blocked out very easily as follows:—Paste any waste piece of old silvered paper or other non-actinic paper over as much of the background as possible, and not in contact with the figure; then with a brush and some of Gihon's opaque, work up to the margin; with a steady hand and perseverance you will succeed finally. To print in a weak background, and give strength, solidity, and smoothness, lay the print on a clean glass, and then lay both into the printing frame, and with Gihon's opaque cover the image carefully to the edges and all over its surface, leaving the portions to be printed in clear glass; the thickness of the glass will then, between the opaque and the image, print in the shade, and this will prevent any sharp lines. If you do your work well, you can scarcely fail of success.

PHOTO MAGIC LANTERN SLIDES.

At a meeting of the Photographic Section of the American Institute, during a discussion on the above subject, Mr. Roche said that, for lantern slides, emulsion plates gave the finest films, good bath plates next, and carbon last; that silver pictures for transparencies gave brilliancy and more contrast, and that many of the pictures exhibited were under-exposed and over-developed, thus giving too great a contrast, and lacking in detail. Pictures for the lantern should be full of detail, soft, and brilliant. Anything approaching a veil or fog over the picture is fatal. The high lights should be almost clear glass. The opinions of the other members coincided with the remarks by Mr. Roche.

Mr. Newton, the President, remarked that he presumed it was not generally known, even by emulsion workers, what an increase of sensitiveness to the action of light was produced on an emulsion plate by the application of the alkaline development. In this respect it differed entirely from the action of an acid iron developer on an ordinary bath plate: whereas the iron developer on an ordinary plate nearly destroys its sensitiveness to the action of light, the effect of an alkaline developer of an emulsion plate increases its sensitiveness at least a hundredfold. He also stated that he had fogged an emulsion plate during development with the light of a kerosene lamp turned low and protected with manilla wrapping paper. This was occasioned by simply holding it a little too near the light to determine the stage of development. The fog commenced nearest the light, and diminished in the ratio of its distance from it. In the centre of the plate, beneath the rubber of the pneumatic holder by which it was held, and where it was entirely protected from the action of light on the back, it was wholly free from fog, and remained perfectly clear. By exercising more care, in removing the lamp to a greater distance and protecting it with more thickness of paper, he met with no further difficulty. He gave it as his opinion that much of the trouble experienced by those trying emulsions arose from developing in too strong a light.

Mr. Roche stated that, in working some good emulsion, the plate during development fogged. He therefore stopped out all light possible in the dark room, and then the plates developed clean and perfectly free from fog, confirming the remarks of the President on that subject.—*Scientific American*

Proceedings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The meeting of this Association held on Thursday, the 19th inst., at the Andersonian University, Mr. JOHN STUART, President, in the chair, was a "popular" one for members and friends.

Dr. JOHN NICOL gave a descriptive lecture on Aberdeen and its

surroundings, the pictures being by Messrs. G. W. Wilson and Co. The series was a large one, and every picture was a subject possessing interest. The lanterns were supplied and managed by Messrs. Mason and Co., and the light was clear and steady.

After votes of thanks to the Lecturer and to the Chairman the meeting was adjourned.

At a meeting of the recently appointed Carbon Committee, the Secretary was instructed to send the following letter to the Bristol Amateur Photographic Association:—

Mr. H. A. H. DANIEL, Hon. Sec.

DEAR SIR,—Had your Association resolved that application for renewal of Swan's patent in connection with carbon should not be opposed by them, that would have been simple, and no one could have had the least objection; but the reasons you have given, and which form part of the resolution, were in no way warranted, and are open to objection.

You misunderstand our object in thinking we desire to disturb any one's true interests, much less that they should make sacrifices; but we wish to see to the public good. We do not object to the patent running its full course, and those interested getting the full benefit from fourteen years' rights or monopoly; our object is to try to prevent undue extension.

You say that "under existing patents good and reliable tissue is manufactured." We have no need to answer this further than to say that there are, and have been, many complaints by the users respecting the quality and irregularities of the tissues.

"Non-renewal would chiefly affect professional photographers, and would not increase the scope for fresh discoveries." We think it would affect all equally in proportion to their interests and their practices of the art, except that amateurs do not pay so much for their licences; and if it be amateurs who make all the discoveries it will certainly hamper them, because they cannot do anything which may not be questioned.

"It is generally admitted as incontrovertible that few, if any, discoveries of importance have emanated from the professional community." If this proposition be incontrovertible, of course there can be no answer to it, but we do not believe this can be applied to the photographic any more than to any other profession. We believe that industry, brains, and genius overcome what are called insuperable difficulties.

The steam-engine was not discovered by a professional, neither was steam navigation or railway locomotion. Sir William Thomson is not a professional electrician; Arkwright was not a professional spinner; Dr. Livingstone was not a professional missionary; Daguerre was not a professional photographer, nor Fox Talbot, nor Archer, nor Swan, nor Johnson, and we suppose that even Lambert cannot claim that designation; yet were they not all really professionals? We think they were, and claim that they have all been as much professionals as any others who can be thus designated.

Our Committee have given instructions that this answer should be forwarded to your Association, to which we, at the same time, desire to show all respect, and to present our good wishes.—I remain, dear sir, your respectfully,

ALFRED ROBERTSON, Hon. Sec.

Glasgow, April 19, 1877.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Thursday evening, the 26th ult., at the Free Library, William Brown Street, the Rev. H. J. PALMER, president, in the chair.

The minutes of the previous meeting were read and passed, and Mr. W. E. Potter elected a member of the Association.

Mr. H. HOULGRAVE exhibited some negatives taken by Bolton's washed emulsion, on plates one and two years old, showing no deterioration; also a gelatine plate prepared by King's formula.

The SECRETARY said he had written to Mr. L. Warnerke, who had kindly sent him some specimens of his tissue negatives. These he would pass round, and they would see what excellent results Mr. Warnerke was able to secure with his tissue. One or two, they would see, were of greater softness. These were on a new kind of tissue, which would shortly be in the market, and which was quite transparent without any application of collodion, as was previously necessary. One of the negatives had all the appearance of having been taken from the landscape direct; but it was merely a negative obtained by printing by superposition from a positive print obtained at a shop, and exposed to gas-light for a minute, the long exposure overcoming the difference of texture in the paper print. Mr. Warnerke said he rarely now heard of failures in development, but if such happened it was invariably due to bad chemicals. Sometimes failures occurred in the inability to remove the film from the supporting paper. The cause was either that the tissue was not dried first, or that rubbing the back of the negative with turpentine had been omitted. Some failures were caused by not thoroughly fixing the

negative, and this could be avoided by fixing in the light, as the mistake could be then seen at once. If the negative showed a want of brilliancy, the remedy was to begin the development by using at first a very small quantity of pyrogallie acid, and increasing it when necessary.

A hearty vote of thanks was passed to Mr. Warnerke for his kindness in allowing the members the pleasure of inspecting his excellent negatives.

Mr. J. A. FORREST then introduced to the meeting Mr. J. Valentine, of Dundee, who met with a most hearty reception. He (Mr. Forrest) handed round a series of pictures taken by Mr. Valentine for the use of artists, Mr. Valentine giving an interesting description of his method of working and producing them.

A letter was read from the Glasgow Photographic Association in reference to the question of carbon patents. It was considered, however, that the Association could not take any action in the matter.

The PRESIDENT then read a paper, "Comparative Experiments with various Dry Plates (see page 205). The paper was illustrated with a number of negatives and prints taken by the various processes.

A vote of thanks was passed to the President for his paper, and some discussion followed.

Mr. FORREST, in reference to the long development of collodio-albumen plates, recommended that a number of plates should be placed to soak in the pyrogallie developer for some time; they could then be more rapidly developed, using one dish for the silver in which to finish the plates singly.

It was decided to have an excursion to Shrewsbury, Haughmond Abbey, &c., on Wednesday, the 16th instant.

The meeting was shortly afterwards adjourned.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place on Tuesday, May 8th, at 6A, Pall Mall, East (the Summer Exhibition of the Society of Painters in Water Colours being on view), when the discussion on the "Nitrate Silver Bath," introduced by Mr. John Spiller, F.C.S., will be resumed. Also a paper will be read by Captain Abney, R.E., F.R.S.

ALLEGED MAGNETO-PHOTOGRAPHY.—Mr. William Brooks has recently communicated to the South London Photographic Society some astonishing statements (which we find in both the *Photographic News* and the *British Journal*) regarding impressions which he claims to have obtained in a sensitive plate exposed, in total darkness, to the influence of a magnet—said impressions being analogous to those due to light. The probabilities are that the investigator has overlooked conditions in his experiments which would give another and more likely cause for his results; and certainly no one will accept the latter according to his interpretation, in the absence of proof of the most convincing and conclusive nature. Mr. Brooks places a horseshoe magnet, about eight inches in length, poles uppermost, in a dark box. Over the poles, and about three-eighths of an inch distant, he suspends a card, blackened with Indian ink on both sides, and pierced with certain letters and geometrical figures. One-eighth inch above the card he places his sensitized plate, so that the latter is thus half an inch distant from the magnet. The exposure lasts from three to fifteen minutes, after which the plate is removed and developed. Where the perforated parts of the card have not intercepted the magnetic *aura*, or influence, or mode of motion, or vibration (the reader may choose his own terms), sometimes a negative and sometimes a positive image is developed, as if ordinary daylight had had access to the plate. It will doubtless astonish many to find that a card is capable of intercepting magnetism, as it is currently believed that that natural force acts through all interposed bodies—as would-be inventors of magnetic cut-offs have discovered to their confusion. But this is not ordinary magnetism—it is *aura*—the imponderable agent which Reichenbach conceived, and supposed to emanate from most substances, and to affect people as well as sensitive plates. Mr. Brooks wisely offers no opinion on the matter; but not content with the remarkable statements already made, he adds that upon his plate appeared a portion of a word, which was not in perforated letters on his card screen. After examining

the latter with great care, he discovered that the word was printed on the card, but was illegible except when the card was held at an angle, and then only very faintly, being thickly covered with Indian ink. This spoils a good story by making it too strong. If the card intercepted the magnetic *aura* so that the same could only act through the perforations in the first case, how could the same influence, acting on another part of the card at the same time, go through that card where the printed letters were impressed? And why did it not reproduce all the printing on the card instead of selecting a portion of a word? There is a mysterious discrepancy about it all, which makes us think that Mr. Brooks is a "medium."—*Scientific American*.

To Correspondents.

F. M. Y.—So far as our experience and observation go, any process of intensification which secures opacity by piling up material on the image is unsuited for reproduction of fine line work. We prefer methods which secure opacity by colour rather than by thickness of deposit. A brilliant intense image as possible should be obtained by the first development; then allow the plate to dry; next run an edging of varnish round to prevent the film lifting; moisten and apply a five-grain solution of bichloride of mercury, until a uniform grey tint is produced; wash, and then apply a one-grain solution of iodide of potassium until a greenish drab tint is produced, which is very adiacetic. Or a weak solution of old, used, hypo fixing solution may be employed instead of the iodide, and this will give a black image. The advantage of drying first is that the film and image are in a less spongy condition, and, therefore, the intensifying is less apt to spread and clog the fine lines. The use of a sulphide for intensifying is also good as securing density by colour rather than thickness. But you must remember that in making a reduced copy of a subject in line there comes a practical limit to the possibility of keeping fine lines clear and open.

B. L. G.—It is quite possible to make a toning bath which may be used at once. We frequently do so. We generally keep chloride of gold in alcoholic solution; making it by breaking a fifteen-grain tube into a two-ounce bottle, adding to the gold salt fifteen drachms of alcohol. To make a toning bath for working at once, we take a drachm of the gold solution, and mix it with a little prepared chalk into the consistency of cream. To this we add five or six ounces of hot water, at about 160° Fah. As soon as the solution is cool, it is fit to use, and generally tones satisfactorily. The sulphocyanide of gold toning bath is also ready as soon as it is made. 2. Quick washing in many changes of water is better than long soaking.

R. D.—As a rule, pyroxyline which gives a large undissolved residue on placing in ether and alcohol is bad, and is always inconvenient and wasteful.

G. G.—Registration at Stationers' Hall does not confer copyright: it is merely a record of existing copyright, which is necessary before an action for infringement can take place.

ENQUIRER.—Your question as to "what salts of potassium are used for enlarging" is too vague and indefinite for a satisfactory answer. Salts of platinum are not used for enlarging purposes. They are used in various toning and printing operations; but it depends upon what method you are working as to which salts are used. It is probable that you are thinking of Willis's process, which is patented, and can only be used by permission of the patentee. You will find all details in the specification, and should you wish to work the process, you will be able to obtain the materials of the patentee, or his agents, the Albion Albumenizing Company.

K. T.—It is better to use hydrochloric acid than salt, as a solution of the latter will hold a little chloride of silver in solution. If too much water is used it is difficult to get the chloride to deposit. Add a little nitric acid, and give it time. 2. Add the hypo negative fixing bath to the print fixing bath, and throw the silver as a sulphide with liver of sulphur; or, as a metal, with clean pieces of zinc. 3. The intensifying solutions may be added to the hypo solutions. 4. We cannot, as a rule, say what prices should be. But we may say unhesitatingly that we do not think 1s. 6d. each for 12 by 10 prints, including taking five negatives, and taking journeys, was too much, or indeed sufficient. Where journeys are undertaken to produce negatives, it is wise, as a rule, to make a specific charge for this, and then charge a legitimate price for the prints.

DAVE.—A negative after fixing, washing, and drying, may be intensified in various ways. You will find one method with mercury and iodide described above, or the method above described may be followed by hydro-sulphate of ammonia.

G. M.—Full details of the Exhibition of the Photographic Society will appear in due time. None are definitely fixed yet. Several Correspondents in our next.

The Photographic News, May 11, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHERS EN GRAND SEIGNEUR.—M. REMELE'S SECOND VISIT TO AFRICA.—HONOURS FROM ABROAD TO MR. FOX TALBOT.—AN ALCOHOL BATH IN CARBON PRINTING.—HARDENED PLASTER OF PARIS.

Photographers en Grand Seigneur.—Photography has long been a favourite pastime among the nobility and gentry of this country, while in Germany, France, and Russia the art has also been taken up by the highest in the land. More than one German prince is an accomplished photographer, and counts, both Russian and French, are known to fame through their work with the camera. In this country we have but to mention the name of the Duke of Edinburgh to indicate the rank of photographic amateurs, his brother, the Duke of Connaught, being also, we believe, both chemist and photographer. It is, in fact, due in no small measure to the amateur photographers of Great Britain that dry plate photography has reached such a high state of perfection in this country, dry plate workers, almost to a man, being amateurs. One British amateur has recently been at some great expense to carry on his cherished pursuit. Mr. Thomas Brassey, M.P., who has during the past winter been making a journey round the world in a yacht of his own, made it a pleasure to have a portion of the hold fitted up as a photographic dark room and laboratory, in order to secure pictures of the many interesting places he visited. Mrs. Brassey is an accomplished photographer, and has been for some years a member of the Photographic Society, and she it was, in all probability, who suggested this arrangement. The yacht is said to be a magnificent craft, built at Birkenhead, and named *Sunbeam*. Mr. and Mrs. Brassey were accompanied by several friends, so that the journey was made as pleasant as possible; and the size and equipment of the vessel were such as no doubt to render the life of its passengers very agreeable. The yacht first visited Buenos Ayres, then touched at various islands in the Pacific Ocean, paid a visit to Japan, China, and the East Indies, and finally came back home through the Suez Canal. There was consequently plenty of food for the camera, and, no doubt, Mr. Brassey has brought home a numerous and valuable collection of pictures. A tour of the same nature was made about a score of years ago by Prince Jerome Bonaparte, who adopted the same means for securing photographic reminiscences of his voyage. In this case, also, the yacht was a magnificent affair, carried a number of visitors, and was provided with everything to make matters pleasant. Whether the ship was run up a swamp creek on the West Coast of Africa, where nothing but rank grass and alligators abounded; or put into some cannibal port in the Pacific, where the warlike attitude of the savages rendered a lengthy stay impolitic, the Prince and his friends no sooner stepped from the inhospitable shore again into his own cabin, than they found themselves in an elegant saloon surrounded by all the luxuries and comforts of civilized life. Travelling and photographing under such circumstances are to be envied; the voyage must be pleasant while it lasts, and the photographs secured remind one still of the pleasures after these have passed away.

M. Remele's Second Visit to Africa.—While on the subject of photographing *en voyage*, we may mention that Herr Remele has again acceded to a request from the Emperor of Germany to accompany an expedition to North Africa as photographer. Our readers remember, no doubt, the graphic account given by M. Remele of his travels through the Libyan Desert, which appeared in these columns, and in which a photographer's troubles in the Desert are vividly depicted. M. Remele goes this time to Morocco, with an expedition of which Captain Zembusch, of the German Marine, has been nominated chief. The expedition goes with a message from the Emperor of Germany to the Sultan

of Morocco, and it affords, therefore, a peculiarly favourable opportunity for studying the nature and inhabitants of a country of which Europeans know very little. We are glad to hear that M. Remele has written to Dr. Vogel promising an early account of his travels, and this we shall not fail to put before our readers as soon as it appears.

Honour from Abroad to Fox Talbot.—We are glad to see that foreign nations do not omit to do honour to "the still living discoverer of the camera negative and paper print process," as Fox Talbot is described by a German contemporary. As negatives produced in the camera and prints upon paper include the whole practice of photography at the present day, acknowledgment of Fox Talbot's services is particularly wide and comprehensive. Our English pioneer certainly deserves all the credit given to him, for he, undoubtedly, invented photography as we now practise it, by indicating a means of securing transparent photographs from which prints could be taken. An influential industrial Society at Berlin, the Verein für Gewerbefleiß, has spontaneously elected Mr. Fox Talbot a honorary member, the honour being enhanced by the fact that many gentlemen of importance—among others the well-known chemist, Professor Hofmann—spoke in favour of the step with much warmth. The influence of photography upon science and culture formed the subject of the learned Professor's remarks, which were received with considerable enthusiasm. The proposition emanated from Professor Vogel, a name with which every one of our readers must be familiar.

An Alcohol Bath in Carbon Printing.—Some experiments made in the laboratory of the Industrial College of Berlin point in favour of the use of an alcohol bath after the tissue has been sensitized. If tissue is dipped into a bichromate bath, and then permitted to become partially dry by hanging for half an hour, and then further soaked for five minutes in a bath of spirits of wine, the drying afterwards goes on much more rapidly. In fact, by this plan of operating it is possible to get the tissue ready for printing within an hour, for as soon as it comes out of the alcohol bath it dries almost immediately. This tissue, sensitized at ten o'clock in the morning, is converted into finished pictures by the single transfer process by four o'clock the same afternoon. However, as we explained in these columns a few weeks ago, the method adopted by Mr. Mayland is a simpler one still, while at the same time the tissue dries quite as expeditiously as when alcohol is used, Mr. Mayland's plan being to keep the wet tissue in a warm cupboard to facilitate the driving off of moisture. Alcohol is likely to have an influence upon the bichromate salt, but, at any rate, the employment of a spirit bath is an expensive and roundabout arrangement.

Hardened Plaster of Paris.—M. Caussin, a German chemist, has discovered a method of hardening plaster of Paris, and rendering it in every respect as resistant as stone or metal. It is a fluid which is had recourse to, and which, impregnating the porous compound, renders this at once of a granite-like nature. Any fine details or lines upon the plaster of Paris are preserved in all their delicacy and sharpness, so that for photo-reliefs the process will be especially useful. There is little difficulty, as photographers know, in securing a gelatine image, or its impress in plaster, but these are, as a rule, too delicate for hard wear and tear. Let us hope that the process of hardening plaster of Paris discovered by M. Caussin is a sound and practical one, and easily applied. Unfortunately, the inventor has so far kept the nature of the fluid he employs a close secret, and has not yet been prevailed upon to divulge its nature.

PHOTOGRAPHIC DIFFICULTIES.*

BY F. YORK.

THE subject I have selected is one, I fear, that will not be considered of that instructive nature it ought to be. I

* Read before the South London Photographic Society.

will endeavour to combine a little mirth with a few practical hints. Many of the incidents I shall allude to caused me much annoyance, vexation, and trouble. I can now smile at them, although they had a very contrary effect at the time. Taking views of London is very trying to one's nervous system. I used to be considered rather amiable. I am thought the opposite now, and all through this class of work. The English climate is so variable, and the London atmosphere so peculiar, depending upon the wind. Living as I do at the extreme West, I have scores of times left home when beautifully bright, and the wind from the West; journeying eastward the atmosphere gradually gets misty, but at three miles distance the buildings at the ends of very short streets are very hazy. I have lingered about for hours whistling, like a sailor does, for a breeze, with the same result, I imagine. I return home without unpacking my things. When the wind is from the East, I have often seen the sun almost red with haze, and concluded it was useless leaving home, and, to my annoyance. I have found that the day in the city has been unusually fine.

I never attempt a view unless the light is favourable, for the slightest haze is fatal to a London photograph. There are some views, particularly distant ones on the Thames, that require exceptionable days. I have gone to two places in particular as many as twenty times in the season without taking a satisfactory negative: it is a common thing to go to many places three or four times, and do no good, owing to the atmosphere. These peculiarities are so common that I am obliged to regulate the work accordingly, going eastward when the wind is from the East, and keeping westward when the wind is from the West, these being the two prevailing winds. I have often risen at three o'clock in the morning to do early views, and have been anxiously watching the rising of the sun, waiting until he is sufficiently high; but my old enemy is rising with him. In this case nothing can be done, for the general fire-lighting has begun, and London is in a mist until ten o'clock. I have found it almost an invariable rule that work done between seven o'clock and ten is unsatisfactory.

When I first attempted street work, I tried a tent. Many are the troubles and vexations I have encountered. The first form of tent I used was an imitation Smart's, with flat top on which was placed the water-tank. It must have closely resembled a shower bath, for I have often been surrounded with a crowd, and described when inside as a cove taking a shower bath. The next form I used was Leake's box tent, this was a very convenient form, but as it was so constantly knocked and blown over, I was obliged to discard it. I then tried Wilson's. The one great advantage with this was its extreme portability; but there were many disadvantages—dust, wind, the curiosity of outsiders to lift it up to see what was going on inside, and the difficulty of finding places to erect it. The tent nuisance at last became so unbearable, that I resolved to start a trap, and purchased a two-wheeler of Mr. Earl, of Worcester. This was a mistake, for it could not be used with the horse in the shafts, and it is very difficult to find retired spots where the horse could be taken out; this circumstance was the cause of many mishaps. I was once engaged on Whit Monday, the horse standing near the shafts with his nose-bag on, when a pleasure van with a band playing most vociferously startled the horse, the nose-bag became entangled with the end of the shaft, the plunging of the horse upset the cart just as I had stepped out of it, and you can readily imagine the mess caused by the upsetting of eighty ounces of bath, and the majority of bottles smashed. Had I been inside, I think my most intimate friend would have failed to recognize me half-an-hour afterwards smothered with silver bath, colloidion, &c. This, of course, terminated my day's work. It would not have made a bad subject for an illustration in *Punch*. Several other accidents happened. When in use, legs were used to make it firm; on two or three occasions my assistant attempted

to get inside before they were adjusted, when suddenly down went the cart, and extinguished him. The next vehicle I had built specially for me; the style is a hooded wagonette which answers admirably; I have not had any mishaps with it. It is often an object of great attraction, and many guesses are made as to its use: these are some of them—an ambulance, fever or small-pox carriage, and when near a cemetery, the workhouse hearse (the horse being black tended to corroborate this idea).

I am now so well known to the police that I get great assistance from them in keeping back the crowd. When I find a difficulty in taking a photograph from the pavement I get into the gutter; the traffic keeps them back from the front of the camera. I am sometimes so bothered that, after focussing, I take the bearings and turn the camera at right angles and talk to the crowd, asking them to be steady just while I count one, two, three, up to fifteen; my assistant puts the plate in, turns round the camera, and exposes, whilst I am telling them that if they will only be quite still, they will have the pleasure of seeing their faces for sale in the *shop windows*, with the ballet girls and bishops. In resorting to this dodge it is necessary to use a larger plate than necessary, to allow for any error in turning round the camera. The following is a common and most annoying circumstance: imagine a view to be taken across the street in a very busy thoroughfare with only occasional sunshine. You see in a few minutes the sun will be obscured; you rush to expose, when an omnibus stops to take up or put down a passenger; when started the sun becomes obscured; after waiting for five minutes or more the sun is bright, a loitering cabman catches sight of you, and asks your charge to do a good-looking fellow like himself. It is useless to remonstrate. The next obstruction is a mud cart, then a stream of heavy traffic carts loaded with straw, or a block—all this time the sun is shining beautifully. When all this is cleared off, cloudy again, and no chance of taking the photograph. This is not an exaggeration, it is one of common occurrence. I always give long exposures for such subjects, to prevent ghosts.

I often wish to introduce figures, but this requires the greatest caution, for if the crowd catches the idea, off they all go to be taken; in that case it is useless to interfere, for a crowd collects which takes a long time to disperse. To get rid of a crowd I am often obliged to take away the camera, and come back again when the place is clear. Sometimes I am annoyed by troublesome people who will persist in being taken; I then put on an appearance of indifference, as though it was all over, and so tire them out; it is useless to attempt to take them, for they invariably move on during the exposure if not asked to be still. When an opportunity occurs of working from a first floor window, it is a great treat. I generally acknowledge this favour by sending some photographs. I was once tendering my thanks in this way, when I was curtly informed that was an old story, and one never fulfilled; the price was five shillings, which I paid, with thanks for the accommodation.

I will now describe my apparatus. The camera-stand I use is a very old form, lately resuscitated, I think, by myself. Mr. Ayers lent me his, which I liked so much that I got Messrs. Oakley to make me two, and advised him to make them for sale. He did so, and had a block cut, which he registered, and many thought he had registered this old form of stand, but it was only the wood-cut. I find it most useful having a range from three feet to six, allowing of its being used very low when doing a flat tomb. It allows of adjustment in the most awkward positions in the roof of a house, in the seats or stalls of a church, when doing interiors. I now often wonder how I did without it so long.

I never use a swing-back, for various reasons. It prevents the camera (the form I use) from closing sufficient for the shortest focus-lenses; it adds to the bulk and expense. I find the sliding front answers every purpose. I have an additional piece hinged on the front, which allows of its

going up any height. This arrangement would not do for the old form of lenses of large diameter and small field. The small diameter of the symmetrical lenses is a move in the right direction—portability and lightness combined—evidently the result of the studies of a practical man. One flange answers for a stereoscopic lens, or one covering a twenty-inch plate. With the sliding front I can succeed in taking a building at an angle of forty-five degrees. This brings the subject almost close to the circle of definition. Blocking out the sky, of course, is necessary. By reversing the camera front I am enabled to photograph from an elevation, and still keep the camera perfectly level. This is very important for flat tombs in confined situations. I invariably keep the camera quite level.

To keep the camera-stand steady when windy, I have improved on the old idea of the loop for placing the foot in and bearing heavily on it, by introducing an india-rubber door spring, which allows the foot to remain firm on the ground, instead of moving, and, perhaps, doing what you are anxious to avoid.

I will now go from the streets into some of the most difficult interiors. The Houses of Parliament, Tower, and Temple are the worst, requiring exposures of nearly two hours. Two negatives a day and four cameras at work is a fair average. All sorts of exposures are necessary in Westminster Abbey, from half an hour to two hours. St. Paul's the same.

My experience with interiors varies considerably. One year I found that plates kept in the bath nearly half an hour answered the best; another year I found it the very opposite, from which I conclude it is almost impossible to work to any rule, as it depends in a great measure upon the particular kind of collodion in use at the time. I find it important to use a new bath of forty grains to the ounce, with as little acid as possible, old collodion, with the addition of one or two grains of bromide to the ounce, and strong developer; to use albumenized plates, plenty of blotting-paper, and to keep the backs well sponged out and varnished where the plates touch, and to fix thick brown paper saturated with water on the back of the plate and at the bottom of the camera.

My old enemies, the public, follow me even into sacred places. With exposures of an hour you cannot sit down beside the camera, so I work two; well, on returning to develop, imagine with horror an anxious mother gratifying her offspring's curiosity by lifting up the child to peep into the lens, the youngster steadying himself by holding on to the lens; or an indulgent papa gratifying his little girl by lifting her up to play an imaginary tune with the focussing handle of the camera.

VENTILATION OF PHOTOGRAPHIC STUDIOS.

BY JOHN LAING, F.R.S.S.A.*

In bringing the subject of this paper before the members of the Edinburgh Photographic Society, it is with the view of correcting an evil which, to a very great extent, exists in our midst. It is on the subject of ventilation of studios that I would wish to say a few words. Photographers, it would appear, seem to have a great dread of fitting up a ventilating apparatus in connection with their studios, and more especially in their dark rooms. I have heard various reasons for such non-appliance of a ventilating apparatus. One of them is, that white light would come in and spoil all their work, and thus become a great source of vexation and annoyance. Another reason is, that any down draught which might occur (they very often occur in the general forms of ventilating systems) would raise the dust from the floor and furniture connected with the studio, and while thus floating suspended in the atmosphere of the place, wet plates

would come in for a great share of the mischief which would thus be caused; and to prevent all this photographers would rather suffer an ill-ventilated studio than have all their best efforts spoiled by that inveterate photographer's enemy, "dust."

How often do we see those much engaged in the dark-room operations, when they come into the lightest apartment, wiping the sweat from off their foreheads, and altogether looking as if they were glad to enter a better and more wholesome atmosphere!

There is no doubt that some of our studios are very badly ventilated (if ventilated at all), and this is why there is such a strong smell of sulphuric ether (which is present in the collodion) in those studios, and which, though a characteristic of the profession, yet is very offensive to delicate constitutions, and ladies more particularly. I once met with a lady who had just returned from such a studio, and who went with the intention of getting photographed; but on entering the establishment the "etherial perfume" was so strong and overpowering that she nearly fainted, and had to get cold water applied to her in the manner generally employed when people are in a fainting condition. When she came to herself again, she got into a cab, and drove home; and when I saw her she vowed she would never again enter a photographic establishment; and she has held such places in awful dread ever since.

Now if we had a complete system of ventilation in our studios such accidents would never occur, and the benefit in point of health would be great to all concerned, and more particularly to those who are much engaged in the dark room operations. Such people run a great risk of injury to health. It may not come upon them suddenly, but, nevertheless, its slow progress is not to be overlooked and unheeded. I have actually heard a photographer express himself, when I called to see him, that "he felt his head quite muddled;" and this, undoubtedly, was due to the stifling condition of the atmosphere he was breathing.

I won't say that all studios are alike—far from it—for there are some which I have been in which, on the whole, are well ventilated. Some are ventilated by a current of air being made to pass freely through their studios in the form of a draught, by having two opposite windows, or other opening freely open, and thus causing a draught; but this method of clearing a place is very objectionable from a health point of view.

Now what we want is a complete and continuous ventilation; by that I mean, to have the foul or impure air drawn off as soon as formed, and this without a down draught.

Now there is only one system of ventilation at present in operation that I know of which can bring about this desired end, and that system is the one patented by Messrs R. Boyle and Son, of Glasgow, and which they call "Boyle's Patent Self-acting Air-pump Ventilation." They have no movement in them, and therefore cannot get out of order. They continue to be ventilators as long as the metal holds together, and they are just as efficient in their action as ventilators after they have been up for twenty years as the first day in which they were put up. They are neat in appearance, and can be made to any pattern or design of an architect, and you will see by their price lists they will stand a very favourable comparison in price with any form or system of ventilation now in existence. There are various systems adapted to studios, but they are all more or less inefficient and unreliable. Those which have a movement in them are objectionable, for should they get out of order (as they frequently do), the effect is anything but pleasant. I will only here refer to the Archimedian screw, which we see so often applied to studios and other buildings.

This apparatus is at any time liable to a down draught, and, when such takes place, a continuous down-pour of cold air, sometimes accompanied by rain and soot, and all

* Read before the Edinburgh Photographic Society.

other impurities which are to be found contained in the atmosphere at the house tops. It likewise makes a disagreeable noise at times, to the great annoyance and irritation of all who are unfortunate enough to be within hearing. Its appearance, also, is not in its favour. From its construction it cannot be made more ornamental unless by materially interfering with its efficient action. Mr. Boyle informs me that they have had to remove a great many of them on account of the down draught which they admitted; and they replaced them with their own system, and the air-pump ventilators gave undoubted satisfaction. The syphon ventilator is quite useless as a ventilator. Any system which allows cold air in from above must be condemned, because this cold air coming in cools down the heated and vitiated air naturally found at the ceiling, and this, losing its upward force, is again returned to the apartment, to be again inhaled; and though we are getting cool air, yet we are not getting pure air, which is a great matter, and a point often overlooked, though it is worthy of our best and immediate attention. The ventilation by means of running a pipe into a smoke flue is very objectionable on account of the back draught and disagreeable smell which it produces; and besides this the soot coming into the apartment would spoil everything in the place, and picture frames would soon require re-gilding. Such was the case with John Stirling, Esq., Governor of North Prison, Glasgow, who had his house so ventilated; and Mr. Boyle had to undo the whole system and fit up his own, and Mr. Stirling is quite delighted with the agreeable change that has been brought about.

The air-pump ventilators consist of four sections, each acting independently of the other; the external air impinging on the lower plates (or diaphragms) is deflected at different angles over the central radial plates, and in passing out exhausts the internal chambers, creating a partial vacuum. The foul air immediately rushes up the shaft (connecting the ventilator with the place being ventilated) to supply the place of the air extracted, thus securing a continuous powerful upward current, and no down draught. For studios on the ground floor, with higher buildings around them, they are generally subject to a down draught, owing to the wind striking the higher buildings, and then forced downward with a swirl, and the studio is the place where it is most felt, by its being on the lower ground. Now, for this position of affairs, Messrs. R. Boyle and Son have a modification of this patent, which is entirely impervious to down draught; and such positions as on the top of these studios is the very best place for its efficient action. It is not intended so much to create an up draught, as to entirely prevent a down draught. I have no personal interest in the concern whatever. I only take it up on scientific grounds, and I can only say that if once applied, great will be the satisfaction to all concerned.

In conclusion, I can only say that Messrs. Boyle and Son deserve every credit and encouragement for the useful invention which they have produced, and I have no doubt that before long they will reap the harvest which they so justly merit.

HOW TO PAINT CHROMO-PHOTOGRAPHS.

BY W. F. ASHLE.*

AFTER mounting your print face down on the concave side of the glass, rub over the back with lard (you will then see the picture come out like a transparent positive) and allow it to stand a few minutes, so that the grease can penetrate all the pores and fibres of the paper. Now it is ready for painting. Paint the shadows under the eyebrows with burnt sienna, and the whites of the eyes with silver white. Use cobalt blue for blue eyes, and burnt

sienna for brown eyes. Mix Naples yellow and silver white for the high lights of flesh colour; mix light English vermilion, Naples yellow, and silver white for the dark flesh tints. Use pure vermilion in the centre of the cheek, softened out with flesh colour, and pure vermilion for the lips; for the ears, dark pink. For light brown hair, use raw sienna (if very light, add Naples yellow); for dark brown add burnt umber, also burnt sienna for warm hair. Use king's yellow for all bright yellows (gold, &c.), cobalt blue for all medium blues, adding silver white for light blues, Prussian blue for all dark blues, and emerald green for all light greens; mix Prussian blue and raw sienna for dark greens, adding king's yellow for yellow light greens. Use burnt sienna for browns, adding raw sienna to make a change; carmine for crimson, adding white for pink. Mix carmine and cobalt blue to make dark purples, adding silver white for light purples; use vermilion for scarlet, adding carmine for a change. King's yellow and vermilion make orange. Mix black, white, and red in different proportions to make all greys. Paint all whites with silver white; the dark shades only of black drapery with ivory black.

My experience teaches me that lard gives the most transparency; and paper having more affinity for it than anything else, it is not likely to become opaque.

AN ELECTRIC CANDLE.*

The value of electricity as a source of artificial light has always been recognised, and its utilization has frequently been attempted. The great obstacle, however, which has hitherto prevented the practical attainment of this object is the difficulty of subdividing an electric current, and producing a number of lights from one main source. This subdivision of the current, as it flows from the generator, has several times been attempted, and in some cases—experimentally, at least—it has been attended with success. The fine carbon points were, however, quickly consumed when burnt in contact with oxygen, and thin platinum wires melted as soon as they began to give a perfect light, and, so far as we are aware, no system of subdivision of electricity has come into practical operation.

About the first who attempted to solve the problem was M. Lodyghin, of St. Petersburg, who, some few years since, used a vacuum, burning the carbon out of contact with the oxygen of the atmosphere. The details of his apparatus, however, were imperfectly worked out, and failure resulted.

M. Kosloff then took up M. Lodyghin's idea, and in time succeeded in producing an efficient means of subdividing the electric light. By forming the holders for the carbon points of a special metal, and producing the light in a vacuum lamp, excellent results were produced.

M. Kosloff's apparatus was exhibited in London in May, 1874, and some very successful trials were made with it, and reported upon by us at the time. It does not, however, appear that this invention went beyond the phase of experiment, at least in England, although it was an invention of great promise. Hence, wherever electricity has been utilized, as in lighthouses and for signalling or other purposes, the constant shortening of the carbon points by combustion has to be compensated for, and followed up by clockwork, so that the necessary distance between the points is preserved as nearly uniform as possible.

It has remained for another Russian man of science—M. Paul Jablockhoff, who was formerly in the Russian military service—to demonstrate in practice the feasibility of subdividing the electric current. He has worked out his results in the form of an electric candle, which governs the production of the electric light, and supersedes the ordinary clockwork arrangement. By it he has, moreover, demon-

strated the possibility of obtaining several lights from a single source of electricity.

The first practical trial of this system was made a fortnight ago at the Magasins du Louvre, and the experiments were attended with perfect success. The Marengo Hall was the apartment lighted, and six electric candles were sufficient to shed around a very bright light, which was softened by being transmitted through opal glass globes. Some idea of the comparative value of gas and the electric light under notice may be formed when we state that the Marengo Hall is ordinarily illuminated by means of one hundred argand gas burners of the largest size. The cause of the wide difference between this and other electric lights lies in the fact that electricity plays, so to speak, only a secondary part in producing the light. The light is principally the result of the combustion of the refracting material, which occupies in the electric candle the same position as does wax or tallow in ordinary candles.

The electric candle, as originally designed by M. Jablockhoff, consisted of what may be termed a double wick and a surrounding material. The wick consisted of two carbon points, about four inches long, embedded parallel to each other in an insulating substance, by which also they were separated from each other. This material, which was consumed as well as the double wick, was composed of several ingredients, forming a combination known only to the inventor. Each of the carbon points terminated at the bottom in a small metal tube into which the conducting wires were led. With these candles a series of experiments was some time since carried out by a War Office Committee of Royal Engineers at Chatham. It was then demonstrated as one result that the system gave fifty per cent. greater power of light than had ever before been obtained from any electric light. The next development of the electric candle by M. Jablockhoff was to denude it of its outer casing, leaving merely the double wick with a strip of the insulating compound between the carbon points, which terminated at the bottom in metallic tubes, as before. It was with the electric candle in this form that the hall at the Magasins du Louvre was illuminated, as previously stated. In either case only one electrical machine is needed to produce a number of lights. The positive and negative wires are led from the machine, and branch wires are simply conducted from them at the necessary points to the candles. In this way M. Jablockhoff succeeded in getting as many as eight candles to burn at the same time in the circuit of a single machine of the ordinary kind, with alternating currents.

Arrangements are being made in England to light up one of the East and West India Dock Company's docks in London upon M. Jablockhoff's system, so that the loading and unloading of ships may be carried on by night as well as by day when desirable. Experiments were to have been primarily made in order to test the system, but since the exhibition of the electric candle at the Louvre, M. Jablockhoff has still further improved his system, so that the experiments have been postponed for the completion of the details of the improvement. In the new form of candle the inventor dispenses with the carbon points which constituted the wick, and uses only the outer surrounding material answering to the tallow of an ordinary candle. We have already seen that this compound—to which M. Jablockhoff has given the name of "kaolin," which substance enters largely into its composition—consumes at the same rate as the carbon points. From this material alone M. Jablockhoff now produces results superior in many respects to those which he previously obtained. One point of superiority consists in the fact that he is now enabled to produce as many as fifty constant and uniform lights from a single machine of the ordinary kind, as was recently stated in a paper brought before the Academy of Sciences, in Paris, by M. Dumas. In short, M. Jablockhoff appears to have satisfactorily solved the question of dividing up the electric light by a method capable of practical application,

of insuring perfect steadiness in the light so divided, and of distributing throughout a building lights of varying degrees of intensity. These results point to a very wide application of the system, which appears to possess special advantages for the lighting up of theatres and other large buildings. The application of the invention is being brought out in Paris by a company, of which M. Denayrouze is the manager, the agent in England for the invention being Mr. R. Applegarth, of 7, Southampton Street, Strand.

A NEW CARBON PHOTOMETER.

BY E. K. HOUGH.*

A SHORT time since, in your pages, Mr. Loeffler suggested using four or more different timed negative impressions of the same face as a photometric guide in carbon printing.

Undoubtedly the first stumbling-block of hindrance to the adoption of carbon printing is the invisibility of the image, and the necessity of timing the exposures. Any method of attaining greater certainty and uniformity in that is worthy of consideration. That difficulty seems much greater to a printer already trained to the methods in silver than it would to an entirely new beginner in carbon; and my short experience inclines me to believe that a new beginner will learn to time by the usual meter as quick, if not quicker, than by one made of negatives. But as most of the printers who undertake carbon are trained to judge by the gradually deepening shades of the face, I will describe one I have made as an improvement on Mr. Loeffler's original suggestion.

I made a row of half-inch negative heads, with five seconds' exposures to each, across a 4-4 plate about half an inch above the centre, so that when the hinged back of the printing frame is half open it shows the entire line of faces above. On the back of the glass, over the line of faces—which are numbered from one to ten at the side of each face—I placed strips of mineral paper, the first covering all, the next all but No. 2, and so on till No. 10 has ten thicknesses; a clear glass over all, sealed to the first, protects the paper, and finally the whole is covered with non-actinic paper on both sides, except a strip half an inch in width over the faces. To use, I put in the lower half of frame a sheet of sensitive paper five inches square, or narrower, if only a portion of meter range is to be used. When the first exposure is made and frame opened, the entire line of faces, with their graduated depth of shading, is visible at once, with the same light on each. When pulled up half an inch, and the second exposure made, the first line of faces remains as a guide for the second; and so on until the eight or nine possible exposures are made, giving the great advantage of having all the previous exposures before you in each as a corrective to any variations, thus offering a better guarantee of uniformity than by comparing each time with the one last printed only, or even to a standard strip of graduated tints fixed in the frame as a permanent guide—a strip of toned prints from the faces, for instance.

The same principle might be applied to the old meter with graduated tints on a plane surface, and would avoid much of the difficulty that caused Mr. Loeffler to devise the negative meter. For instance, if while the proof was printing the meter showed to five, and none beyond, the assistant could be told to print the first carbon so far and no further, and then continue so that the rows of tints—which need not be more than one quarter of an inch wide—increased before him at each successive exposure, he could easily see if was keeping an uniform line of shading, as easy if not more easily than with a line of faces. Either method constitutes a genuine improvement on the old system, according to my experience.

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THE SILVER BATH: ITS DEFECTS AND REMEDIES.

A PROTRACTED discussion on the silver bath, continued during several meetings of the Photographic Society, concluded on Tuesday evening, without, we think, throwing any new light on the subject. It served the useful purpose, however, of bringing in review many known methods of dealing with difficulties, and of assigning to many of them their proper functions. The chief defect under consideration was the tendency in the bath to give negatives covered with pinholes. This has generally been attributed to the supersaturation of the negative bath with iodide of silver; and one result of the discussion was to recognize the operation of other causes in producing pinholes. Indeed, the tendency of the discussion was frequently towards a recognition of other causes, ignoring, to a considerable extent, the operation of this most prolific cause of the trouble in question.

That excess of iodide of silver is the most common cause of pinholes there can be little doubt. A most perfect crop of pinholes can be produced at will by adding excess of iodide of potassium to a silver bath, so as to supersaturate it with iodide of silver. This being so, and the ordinary mode of working a silver bath tending to produce supersaturation, the eventual advent of pinholes from the continued use of a bath becomes, under ordinary circumstances, inevitable. The solution is supplied with iodide of silver to begin with, and if not saturated at the outset, it acquires more from every plate immersed, until the point of saturation is reached. So long as this condition of saturation only is maintained, all is well. But the varying conditions to which the bath is subject inevitably bring about the state of supersaturation. For instance, iodide of silver is less soluble in a warm solution than a cold one, and as the temperature rises on a hot summer's day, the solution which in the morning was simply saturated, becomes supersaturated by its solvent power becoming less. Then it happens that the slightest disturbance of the molecular condition—such as the immersion of a plate—produces a precipitate, and the surface of the plate receives a deposit of the minute crystals of the salt present in excess, and pinholes are the result. A similar result will ensue without any variation in temperature. Iodide of silver is soluble in a solution of nitrate of silver in direct proportion to the strength of that solution. When, therefore, a single grain of nitrate of silver is removed from a solution saturated with iodide, its solvent power is reduced. It must be borne in mind that in the operation of sensitizing a collodion plate silver is removed from the bath, and the solution in immediate contact with the collodion film is weakened in proportion,

and loses, therefore, the power to hold in solution the iodide it held a moment before; hence the salt in excess is deposited on the plate in minute crystals, which issue in pinholes. This is a process perpetually going on wherever the ordinary wet collodion process is worked. To avoid the ready occurrence of the conditions producing these pinholes, it will be found wise to work with a full quantity of solution, which will not readily become exhausted; keep up the strength by addition from time to time of fresh solution, and in summer weather keep the silver solution cool. The remedy for such pinholes is dilution of the bath, filtration, and strengthening.

A very common cause of pinholes and similar defects is often overlooked, because it is obvious. We refer to dust, dirt, or foreign matter of any kind in the bath. A plate was exhibited the other night at the meeting of the Society, by Mr. Dunmore, which was covered with pinholes, streaks, and comet-like markings. To the suggestion that the defects were caused by dust, Mr. Dunmore returned the natural answer that as the work was done out in a field where there was no dust, and camera and dark slide were quite clean, he did not think it could be dust. But the appearance of the plate suggested not dust in the form of dust, but a residue of dust or similar particles in the bath, which, being stirred up, would produce just such a result as that shown. The remedy applied with success is confirmatory of this view. Strengthening the bath by the addition of fresh solution effected a cure at once. It is probable that when fresh solution was added the bath was filtered, and the turbid residue removed. To avoid the risk of such spots the use of a dipper which does not permit the plate to go to the bottom of the bath is desirable.

One valuable result of the discussion has been to assign to nitrate of baryta, a remedy much talked about of late, its proper office. It is valuable in removing pinholes when caused by the presence of sulphate of silver in the bath; and the presence of this sulphate in the bath appears to be much more common than was suspected. According to Mr. Spiller, who has investigated with great care, and to whom photographers are in this matter much indebted, almost every example of iodide of potassium he examined was contaminated in greater or less degree with sulphate of potash. The use of iodides so contaminated is probably the most common source of sulphates in the bath. This fact, and the use of nitrate of baryta as a remedy, were, as our readers know, pointed out by Dr. Vogel in our pages many years ago; and we kept the remedy under the attention of photographers in these pages and our YEAR-BOOKS at intervals afterwards. Unfortunately the use of this salt was revived a few years ago as an empirical remedy for pinholes generally, and caused disappointment by its inevitable failure to be of service when applied to baths in which sulphate of silver was not the cause of the defect. Mr. Spiller's experiments, definitely assigning to the baryta salt its special role, which had been by many unrecognized, have been of marked service here.

One of the most interesting elements in the discussion was the introduction at the last moment of Mr. F. G. Eliot's method of working an alkaline silver bath. Upwards of two years ago, in our YEAR-BOOK for 1875, Mr. Eliot described his method, and again in the YEAR-BOOK for 1876 gave the result of continued experience. His method consisted in saturating his nitrate bath with carbonate of silver, instead of adding iodide of silver. A little carbonate of soda was added to the new bath, and the precipitate removed by filtration. As carbonate of silver is slightly soluble in a solution of nitrate of silver, a portion of the carbonate of silver is retained in solution in the bath. The solubility of this salt in a solution of nitrate of silver was questioned at the meeting on Tuesday evening. But a little experiment will determine the question beyond doubt. Carbonate of silver is soluble in water in a slight degree, and still more so in a solution of nitrate of silver, which

shows a marked alkaline reaction after treatment with the carbonate. To work with this bath Mr. Eliot uses a collodion prepared with bromides and iodides of cadmium and potassium sufficiently ripe to have liberated sufficient iodine to produce a lemon colour in the collodion. This trace of free iodine, on combining with nitrate of silver, liberates a trace of nitric acid in immediate contact with the film, and this appears sufficient to check all tendency to fog, which, from the alkaline condition of the bath, might be expected. The advantages Mr. Eliot finds in this method are complete immunity from pinholes, streaks, fog, and the various troubles with which photographers generally are only too familiar, as well as greater sensitiveness, and a finer class of negative. Confirmation is not wanting, although few photographers seem to have had the courage to try an alkaline negative bath. Mr. Spiller mentioned the experience of Mr. Bashford, of Portobello, as very similar. We have heard Mr. Blanchard describe his successful use of a bath treated with carbonate of soda without any subsequent addition of acid. Mr. W. Brooks described similar experience recently. The experiment is a simple one, and, on the successful practice of several capable photographers, we can recommend a trial to our readers.

LICHTDRUCK IN GERMANY.

ALTHOUGH M. Tessié du Motay et Maréchal, of Metz, were undoubtedly the first to produce presentable half-tone prints from a colloid film, Germany has since then been pre-eminently to the fore in Lichtdruck printing. MM. Tessié du Motay et Maréchal proved the method to be sound and practical, but under their auspices it was impossible to provide a gelatine printing block from which more than seventy or eighty impressions could be pulled. Some examples of their work which we have seen show a very high state of perfection indeed, the delicacy and gradation of the impressions leaving little to be desired, and bearing advantageous comparison with proofs that have been produced in later years. In fact, it was simply in the perishable nature of the printing blocks that the weakness of the process lay, and to obviate this was the aim of German experimenters who have since striven, and with considerable success, to perfect the process of colloid printing.

Albotype was the method which, after that of Tessié du Motay et Metz, acquired the greatest reputation. Then there was the method of Ohm and Grossman, who were the first, we believe, to bestow the name of Lichtdruck upon colloid printing; Obernetter, of Munich; Husnik, of Vienna; and in this country Mr. Edwards, who called his particular method by the name of Heliotype. All these processes, as our readers are aware, have much in common with that of the French photographers to whom we have referred, but one and all permit of a far larger number of impressions being taken from a single plate.

None of the processes are now worked in the same manner as when first brought before the public half-a-dozen years ago. Albotype, though in many respects a most perfect method, had one very great defect. Thick and costly glass plates formed the basis of the printing-blocks, and the great pressure to which these are subjected in printing caused heavy loss from constant breakage. Again, the gelatine film, with all the precautions at first used, could not be made to adhere sufficiently tight to the glass surface. Albert, it may be remembered, printed through the back of the glass plate, in order to secure an insoluble film next the glass surface; but even this *modus operandi* failed to secure the solidity necessary. By degrees, however, the process of Lichtdruck printing has been greatly improved, and it is, as we have said, due for the most part to German experimenters that we have now arrived at a very high degree of perfection in colloid printing.

Among those of our German cousins who have laboured hard in this particular branch of photography may be mentioned Professor J. Husnik, of Prague, who is not only a practical chemist and photographer, but a painter of some note into the bargain. Herr Husnik's name is well known as an experimenter in photographic chemistry, and, as he tells us in a volume which he has just published on Lichtdruck, has been practically engaged since the year 1861 upon various methods of photo-mechanical printing. Herr Albert has been a student of his, as many other German photographers of note, a pretty good proof that the Professor is well qualified to speak upon the subject on which he has just written. In a few preliminary remarks he informs us that the information he has published is the result of many years' experience, acquired partly in the State Printing Office at Vienna, and partly at private printing establishments, among others those of Albert, Obernetter, Loewy, &c. His volume consists of one hundred and sixty closely printed pages, and although only the first half of the book deals with the actual preparation of Lichtdruck blocks, &c., the whole may be read with interest by those interested in mechanical printing generally.

We shall, at an early opportunity, give our readers some extracts from Professor Husnik's work, and detail at length the manipulations connected with Lichtdruck as it stands in its most approved form. So that all classes of readers may be satisfied, Herr Husnik first of all gives precise details of the methods followed by Albert, Ohm and Grossman, and others, prior to giving information of his own improved process. He points out the defects and difficulties of all the earlier methods, and shows how these may be overcome, referring especially to the use of silicate, which seems to exert a material benefit in colloid printing. That very perfect prints may be produced by the Albert process, Herr Husnik readily admits; but the employment of glass plates, the elaborate preliminary preparation of the blocks, and double exposures to light that are necessary—matters which increase in difficulty in dark and wintry weather—have stood in the way of its diffusion.

To render the blocks more stable, without having recourse to the laborious manipulations necessary in Albotype, as also to produce a smoother and more uniform gelatine layer, are matters to which attention has been directed of late. The first idea of employing silicate to harden the film and make it adhere more tenaciously to its basis emanates, it appears, from Herr Obernetter, of Munich, although for a long time its use in Lichtdruck was maintained a secret. Soluble silica has been found especially useful, we are told, and the fine Lichtdruck prints which have come to us from Munich and Vienna, where silica is employed in Lichtdruck printing, place the fact beyond a doubt. Another improvement which has contributed to perfect the process is the employment of a solution of gelatine containing alcohol, which is finally poured over the gelatine slab. Minute air-bubbles form, it appears, upon the surface, and these, bursting, create minute depressions, which appear in the finished prints as dark spots. Such defects are at once avoided by the use of an alcoholic gelatine solution, which has the effect, moreover, of producing a block of very uniform thickness. Again, there is no need for drying in a horizontal position (a matter of the utmost difficulty), for Herr Husnik explains that the gelatine plates prepared according to his instructions may be put upon a slope to dry.

It is these last-mentioned improvements to which Herr Husnik calls especial attention, and upon which depends, in his opinion, success in Lichtdruck printing. They render the process at once certain and practical, and fairly bring it out of the domain of experiment into that of industry. We shall take an early opportunity of placing Herr Husnik's perfected Lichtdruck process before our readers.

FRENCH CORRESPONDENCE.

A DRYING CUPBOARD—A NEW TRANSPARENCY TISSUE FROM SEA-WEED—HOW TO PRODUCE STIPPLE FOR PHOTO MECHANICAL PRINTING—REUNION DES PHOTOGRAPHES A PARIS—RECTIFICATION.

At the monthly meeting of the French Photographic Society, which took place on Friday, 4th May, M. Harrison, fils, exhibited a drying cupboard of a very ingenious character. It is a very simple affair, while at the same time it suggested more than one useful application. Briefly described, it is a box (which may be large or small) furnished with horizontal grooves inside, or, more properly speaking, a cupboard in which the shelves are replaced by glass plates held only by one of their extremities in the grooves. The first, for instance, is kept in its place by the right wall of the cupboard, and the second by the left wall; the third again on the right, and so on from top to bottom. As the plates are not so large as the box, there is always between their ends and the walls of the cupboard a certain interval as shown in the annexed figure.



The cupboard is closed by a hinged screen which acts like the door of a chest, having, however, double sheets of metal, between which a lamp may be introduced. The warm air having circulated by the winding passage formed by the plates escapes through an opening made at the top of the drying cupboard, and which is surmounted by a chimney contrived so as to establish a good draft of air. The draft may be augmented by placing a small lamp or night light by the chimney. The drying cupboard is very simple, practical, and inexpensive, so that altogether M. Harrison's contribution to the Society was well received, and especially by those members who occupy themselves with carbon printing, for it is obvious that the cupboard in question is very suitable for the drying of plates and tissue.

A communication which appeared very interesting was made by M. Stenfort, an amateur who has hitherto occupied himself more with botany than with photography. In the course of certain scientific researches M. Stenfort became engaged in the work of reducing marine algae to the state of a very fine powder, which he dissolved and converted into a tissue by drying, several specimens of the same being submitted by him. The sheets which we examined looked very much like sheets of gelatine or collodion, by reason of their transparent nature, but they had all the suppleness of silk, were not elastic, and were exceedingly tough when it was sought to tear them. They seemed to possess all the qualities which are sought for in a photographic film, without the inconveniences of many substances hitherto proposed. Moreover, such films may be tinted to any colour that may be desirable. M. Stenfort stated that the tissue in question can be employed for lithographic transports, and indeed this is, so far, the only trial he has made of the material upon his own account. He thinks, however, that some use may perhaps be made of the material for fatty ink printing, and in other branches of photographic industry. Many of the

members of the French Photographic Society who examined this algae tissue were of opinion that uses could be found for it, and especially in carbon printing. M. Davanne was of opinion that this organic substance might be made to replace gelatine and even collodion. Most of those present begged for a sample of the material to experiment with it. It may be well to add that employment of algae powder would have economy to recommend it, since the preparation of a sheet of the material costs but a few centimes. I shall take care to keep the readers of the PHOTOGRAPHIC NEWS posted up in any results that may be arrived at.

M. Despaquis has communicated to me a method of typography which he has not yet altogether made known, and which he has already practised with considerable success. A positive is taken upon paper, or upon glass, from which is produced in the camera an enlarged negative, reducing according to the wish of the operator. In the passage of the luminous rays, and as near as possible to the collodion plate, is put another sensitized plate, upon which is some very fine powdered plumbago, applied by the aid of a fine piece of linen or delicate sieve. This powder, while very tenacious, is very opaque, and the consequence is that one secures a negative covered with very minute spots both in the lights and in the shadows. A positive impression upon metal is secured by the bitumen process, or by greasy ink, developing a print upon the surface by the aid of carbon tissue made with graver's varnish. This impression exhibits all the tiny holes with which the cliché is covered; etching acid applied, attacks the metal where these tiny openings occur, and the result is a block engraved in relief, from which prints may be pulled in a type press, giving detail and half-tones of the original. This same means—viz., the interposition of a powder screen—may be employed for transferring images upon stone and zinc, the inking-up of the transfer being in this way greatly facilitated.

At the end of the dinner of which I spoke in my last letter, and at the meeting which followed it, it was decided to rent for the Wednesday evening of every week a saloon attached to the Brasserie de Metz, situated No. 6, Place de Valois (Palais Royal), and that all gentlemen connected with the art and industry of photography should be invited to meet there at the time mentioned. Professional and amateur photographers, as well from Paris as from the Provinces, will be found here, so that visitors and strangers spending any time in Paris will know where to meet their confrères in social reunion once a week. The arrangement is for no other purpose than to establish a spot where all can meet on neutral ground, and where they can have the benefit of one another's company, and discuss questions of especial interest to themselves. A very moderate subscription will suffice to cover the trifling outlay that will be necessary, but the amount will not be fixed until more definite regulations are made. I need not state that when any of the readers of the PHOTOGRAPHIC NEWS find themselves in Paris, they will find a most sympathetic welcome at the Reunion des Photographes, if they will present themselves on Wednesdays at the address I have mentioned.

The Municipal Council of the town of Chalon-sur-Saône have just voted the sum of 5,000 francs to erect a statue of Nicéphore Niepce in his native place. It is rather a tardy testimony to the worth of their fellow-citizen, for poor Nicéphore died as far back as 1833.

I see in your last issue of the PHOTOGRAPHIC NEWS that a paper by M. Boivin was stated to have been read before the French Photographic Society. May I be permitted to say that it first appeared in the *Moniteur*, and was not brought under the attention of the Society in question.

ERNEST LACAN.

Correspondence.

WHAT FOLKS ARE SAYING.

THAT the Glasgow Association propose to send Messrs. Urie and Robertson to Coventry.

That the Edinburgh Society propose sending Dr. Nicol to Aberdeen once a month for wrinkles.

That they don't know the difference between G. W. Wilson and Co.'s carbon enlargements, and Annan and Skelton's autotypes.

That the Autotype Company are experts, and will soon tell

That the old carbonist, Tunny, of Edinburgh, has become a chromotyper.

That some more of the best men in Scotland will come over to the carbon camp soon.

That the best means of introducing chromotype to the public is not yet hit on.

That non-licenceses taboo permanent photography.

That they want to know how the *permanence* of a new process is tested.

That ye of "this carboniferous era" ought to educate the public.

That there are too many good men and true troubling themselves about the patents and the pound.

That good men will cease from troubling, and silver will be at rest.

That W. E. Batho is trying to damn carbon with faint praise.

That the "Peripatetic Photographer" is always telling us of his fear to discuss matters of religious belief, and of Sunday photography.

That the "Peripatetic" should give his opinion of "secular business on Sunday."

That Gustave Konigsberger is saying, "I'll mark out 'Murray Russell,' by George!"

That "Ja Vestris" is a two-headed nightingale, spotted here and there.—Yours truly,
JANUS.

MAGNETO-PHOTOS.

DEAR SIR,—My attention has been called to an article which you have reprinted in your issue of May 4th of the PHOTOGRAPHIC NEWS, from the *Scientific American*, respecting the statements that I made at the March meeting of the South London Photographic Society, on so-called magneto-photography. I thank the writer of that article for re-describing my statement. The first part I have nothing to find fault with. The latter part is not correct, for if he reads again, he will find the probable cause why the whole of the letters did not appear—simply because the greater part of the letters had been destroyed by the way I applied the Indian-ink. I use the words magneto-photograph for the want of a better way of expressing myself. I am well aware of the so called *od* light that is invisible to the human eye, and am also aware of its being associated with several things in nature, and also its effect on people as well as sensitive plates; but I find it more strong by developed or associated with the magnet than anything else I have at present tried.

As for the printed letters making their appearance, I cannot account for that, but it appears to me that it was a secondary action of some kind or other set up. I think it very *od*(d) that our friend did not read the latter part of my communication right. I know it has been a difficulty with scientific men to prove that there is photographic action set up. Since I brought the subject forward I have been able to bring it so under control that I can get an image every time with the exposure of two or three minutes, and I fully intend to bring it forward, and be able to expose and develop a plate before the South London Photographic Society. I also take the opportunity to make a further

statement, and that is, I think it *one* cause of the so-called red fog that makes its appearance at times, which originates with the operator himself. If our friend will wait patiently I will deal with that part of the subject, and be able to bring it forward as a fact. I have very strong grounds for introducing this here.

To finish up, he says he thinks I am a *medium*. Most likely I am; and I think we all are *mediums* for imparting any information on any subject that we may be investigating. It is a pity he did not explain himself more fully. I will conclude by returning the compliment. In all probability he may be a *medium* under the control of a very powerful spirit well known in England as "Old Jamaica."—Yours very truly,

WM. BROOKS.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held in the Water Colour Gallery, 5, Pall Mall, on the evening of Tuesday, May 8th, Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a preceding meeting having been read and confirmed, Mr. C. G. Cutcher was duly elected a member.

The CHAIRMAN, after announcing that the discussion on the nitrate bath would be resumed, remarked that Col. Wortley was still unable, from indisposition, to attend, but he had sent a note on the subject, which the Honorary Secretary would now read.

Mr. H. BADEN PRITCHARD then read the following note from Col. Stuart Wortley:—"During a visit to the Autotype Company's Works, last summer, Mr. J. Burton called my attention to a deposit which he found in their silver baths, and of which he was good enough to give me a specimen for examination. Having applied various tests, with a view of discovering the nature of the salt, I informed Messrs. Burton and Wilkinson, at the November meeting of the Photographic Society, that this deposit consisted of sulphate of silver. As I was desirous of finding how and why sulphate of silver appeared so freely in a negative bath, I made the following experiment to see whether it was produced by the collodion:—I took plain collodion, and poured it gradually, stirring it all the time, into boiling water, and after allowing the precipitated pyroxyline to soak for a short time, drained off the water, and having added to it a small quantity of strong solution of nitrate of silver, found, as I had expected, that sulphate of silver was thrown down; and when the precipitated pyroxyline had been thoroughly dried, and had been made into collodion, no further deposit of sulphate of silver was obtained in a silver bath in which collodion made with this precipitated pyroxyline was alone used. I think this experiment tends to show that sulphate of silver, when found in a silver bath, is dissolved out of the collodion. In the course of experiments on this subject, I also found that nitrite of silver is a frequent cause of pinholes in the silver bath, and I have further remarked that it is far more copiously produced when plates prepared with a substratum are used in the bath, than when the plates used are simply cleaned. This we should naturally expect to be the case, as the nitrite of silver would tend to be freely produced where organic matter is brought into contact with nitrate of silver. In the course of these experiments, I have submitted the various commercial collodions, as well as those made by myself, to tests with regard to the production of nitrite and sulphate of silver in the bath, and I find that they vary extremely in their behaviour, one sample of collodion producing sulphate of silver alone in the bath, while the others produce sulphate and nitrite in various proportions, one of the best working collodions producing the nitrite in large quantities, and very little sulphate. If a nitrite is added to a collodion it increases the sensitiveness, and it may be that some makers add a nitrite to their collodion. I noticed at a former meeting what Mr. Blanchard said with regard to the colour given to negatives by the use of nitrate of uranium in the silver bath. It is, undoubtedly, the case that nitrate of uranium does modify the colour of the negative, but the result is more easily gained by the addition of a few grains of sulphate of uranium to the ordinary iron developer. It is certain that the quality of the negative is improved by the use of salts of uranium, and I believe that the excellent printing qualities of uranium dry plates are largely due to the use in the emulsion of nitrate of uranium."

Mr. FRANK GOODE, in response to the Chairman, said he had nothing to add to the discussion. He had been troubled with pinholes, and was so still. He was anxious to get rid of them, but he knew nothing about their cause or cure. He had at one time refrained from adding any acid to his bath, and he knew nothing of pinholes until he used nitric acid, to which, therefore, he attributed his trouble.

Mr. DUNMORE exhibited a plate covered with streaks, comets, and pinholes. It was produced in a bath which had been working well, and suddenly went wrong. He added some strong fresh solution, and all went well, and continued so. He was satisfied, he said, in answer to some questions, that the fault was not due to dust.

Mr. FRY said when a bath went wrong, he diluted with common water, which threw down excess of iodide, filtered, then added caustic potash and ammonia, boiled, made up the solution to the proper strength, set it in the sun for as long as possible; after this, sufficient nitric acid—very little—was added, and the bath generally worked well. When, after this treatment, the bath failed to work, it was placed with residues for reduction. Referring to M. Boissinas' plan of quick working, he said it partly depended on the use of a neutral bath.

Mr. S. DAVIS said the plan just described seemed, with one exception, to be Mr. Brookes' method described at the last meeting; but he worked it in an alkaline condition, whereas Mr. Fry, it seemed, added nitric acid.

Mr. F. C. ELIOT said he had two or three years ago described his method of using an alkaline bath, which he had constantly employed ever since, and he found none of the usual difficulties attending the nitrate bath. His bath was made alkaline by carbonate of silver, and a collodion sufficiently mature to supply all the acid required. When his bath showed any signs of being out of order, he added more carbonate of silver, and he did not believe that a bath saturated with carbonate of silver would dissolve iodide of silver. He was neither troubled with fog nor pinholes, and as he did a good deal of copying, the absence of fog was a matter of importance. He was careful to keep ammonium out of his collodion, using the iodide and bromide of cadmium and potassium.

CAPTAIN ABNEY, F.R.S., said he thought if a highly bromized collodion were used, it would be impossible to work with an alkaline bath. He believed that carbonate of silver was insoluble in nitrate of silver solution.

Mr. ELIOT used a full proportion of bromide, using the double bromide of cadmium and potassium.

Mr. BOOL, in answer to the Chairman, said he was quite familiar with the troubles under discussion, but he did not know of any remedy.

A MEMBER remarked that at the last meeting Mr. Brooks referred to the use of methylated spirits as a cause of pinholes. He had made a great deal of collodion, always using methylated spirits; but had no pinholes.

Mr. SPILLER, in closing the discussion by a brief summary of the experiences, stated that Mr. Eliot's experience strikingly corroborated that of Mr. Bashford, of Portobello, who pursued a very similar plan with great success. Some specimens he would hand round illustrated that Mr. Bashford had a high standard of working. He thought the evidence was strongly in favour of alkaline conditions, hitherto regarded as undesirable.

After some votes of thanks, CAPTAIN ABNEY read an abstract of a technical paper on the theory of the alkaline developer and the photographic image.

The proceedings then terminated, and the meeting was adjourned until June 12th.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society took place on Thursday, May 3rd, in the Rooms of the Society of Arts, Adelphi, the Rev. F. F. STATHAM, M.A., F.G.S., President, in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. F. YORK read a paper on "Photographic Difficulties," during the reading of which he exhibited and described a rising front for the camera, showing contrivances for placing the lens at different heights.

The PRESIDENT said that Mr. York had done good service in relating his difficulties, showing that he would not be beaten by them. Photographers generally should be indebted to Mr. York for the great energy displayed, and the pains he had taken under

disadvantageous circumstances. With regard to his operations in sacred buildings, the results were of much higher importance than the simple commercial element, for they became of historic value—as, for instance, in the spread of our race in distant colonies, by these works they would have an opportunity of becoming acquainted with those grand buildings which were the pride and ornament of our own times.

Mr. HOWARD remarked that he also had had some experience in street photography, and had used a duplicate dark slide, which, having been put into the camera, was then taken out, and another substituted, holding the prepared plate, which then could be exposed without interruption. Also, that in steadying the camera upon smooth floors, some corks put upon the iron spikes of the stand would be found very useful. He narrated that being out in the country, his friend's camera was blown over, and openings made in the wood-work. They went into a village, and getting some putty, carefully filled up the cracks, and so got over that difficulty.

Mr. YORK observed that in using a rising front, great advantage arose from the introduction of the small symmetrical lenses, as they could, from being so small, be brought right up to the top of the camera; and stated that having, on one occasion, gone out without a dark slide, he simply wetted the inner face of the focussing glass, and laying the sensitized plate upon it, it remained fast whilst being exposed.

Mr. SPENCER also related that when taking a country view, it being just upon twelve o'clock, about five hundred children rushed out of school. He told them to sit in a row along the roadway on the opposite side, and they would all be taken in. As soon as this was done, he took his view, and the children were taken in also.

Mr. MAWDSLEY narrated that, finding himself on one occasion without the screw of his tripod stand, he pared a piece of hard wood, and forcing it into the worm, thereby made a thread which remained so perfect that he used it for a week afterwards.

A vote of thanks having been passed to Mr. York, Mr. BROOKS exhibited some specimens of emulsion transparencies, showing that he could produce great variety in the tone of colour.

Mr. YORK then stated that there were two subjects he was investigating which others might like to experiment with: one was the addition of acetic acid to the collodion, which remained the same colour as before. A neutral bath which gave fog, when tried with this acetic collodion, gave very satisfactory results—he had used one drop of acetic acid to one drachm of collodion. The other experiment was that mentioned by Mr. Henderson, namely, the use of alum instead of spirit in the developer. He (Mr. York) thought that possibly any sulphate—either of magnesia, soda, or potassium—might answer the same purpose.

The PRESIDENT remarked that at the present moment, there being a dearth of new discoveries, it was as well to return to subjects which, although old, might from the results of experience be made interesting; and alluding to Mr. Brooks' experiments with the magnet, said that although the matter was at this moment simply an experiment, it might turn out of great importance.

Mr. BROOKS observed that in carrying on further experiments with the magnet, he had been able to reduce the exposure from fifteen to two minutes, and also that in the remarks he had already made upon the subject, with a certain purpose in view, he did not state all the conditions under which he worked, and promised to be ready at the October meeting with another paper upon the same subject.

Mr. PEARSON said that the facts which might arise out of Mr. Brooks' experiments none may guess. Modern researches tended to show that light produces electricity. The proposition was that force or power was not destroyed. It had been shown that, taking the swing of a needle put in motion by electricity to be represented by 19, the force of the back swing was more—viz., 21. What, then, became of the force of light? In the human eye such was the power exercised by light that it became necessary for darkness and sleep to intervene, so as to recover its normal condition. Much, then, had to be investigated in connection with light as to its proper function in exciting electricity, so that the experiments of Mr. Brooks may help those who work in that field of enquiry.

Mr. B. J. EDWARDS having promised a paper on the "Nitrate Silver Bath" for the next meeting in June,

The proceedings terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in the Hall 6, St. Andrew's Square, on Wednesday evening, May 2nd. Mr. GEORGE A. PANTON, vice-president, in the chair, when the minutes of previous out-door and ordinary meetings were read, and the following gentlemen were admitted ordinary members:—Messrs. J. M. Skinner, J. Somerville, J. Reid, H. Millikan, J. Boyack, A. Bogie, J. McLaren, J. Ballastyns, and D. Reid.

The business of the evening was begun by the reading of a paper on "Ventilation of the Studio" (see page 219), by Mr. JOHN LAING, in the course of which he exhibited several working models of the apparatus recommended, the action of which was considered very satisfactory.

At the conclusion of the paper, Mr. BLANC, of Her Majesty's Board of Works, exhibited, in action, a model of a ventilator, the invention of Mr. Emerson, of America, which, he said, depended for its action on the same principle as that shown by Mr. Laing but was evidently much simpler in construction, and, according to his account, produced an up-draught with much less wind. He stated that these ventilators had been fitted up in a number of government offices, and were giving the utmost satisfaction even such large and fully occupied rooms as those of telegraph operators and letter sorters being kept comfortably cool and pure.

Mr. PANTON thought the members were much indebted to Mr. Laing for the clear exposition of Boyle's ventilator, and especially for the satisfactory experiments that he had shown. Throughout the paper the ventilation of the studio had been spoken of, while, in reality, it was rather the ventilation of the dark room that had been mainly referred to, the latter being in reality more necessary than the former, and, in most cases, more difficult to manage. While he fully appreciated the advantages of Boyle's patent, he thought the system which they had in use, and which he supposed was the invention of their predecessor, Mr. Moffat, was at once the simplest and most efficient he had seen. Immediately over one of the windows, and within a few inches of the roof, there is an opening made in the wall, about eighteen inches wide, and six inches in depth. This is covered by a board, hinged at the bottom, so arranged that it can be kept permanently open to any desired extent. One or two of the panes of the window were made to open, and the result was that the pure air rushed in through them, and the heated and impure air escaped by the opening above.

Dr. JOHN NICOL had no doubt that under certain conditions the ventilators both of Boyle and Emerson would be very useful. In theory they seemed to be faultless, and, judging from the action of the models, they would be found equally good in practice. In principle they were identical, but he rather inclined to give a preference to Emerson's, both because of its simplicity, and of its requiring a lighter current of air to bring it into action. They had, however, he thought, one defect in common—i.e., that they required a current of air to bring them into and keep them in action. So long as a pretty stiff breeze was blowing, it was not difficult, as a rule, to ventilate ordinary studios or dark rooms; but in such days of sweltering sunshin, when there was not sufficient wind to stir the leaves of the silvery beech, these ventilators would be of no use whatever, and those were just the days that ventilation was most required.

Mr. LAING replied that while Emerson's ventilator was certainly more simple than those by Boyle, they, in his opinion, were objectionable, as under certain circumstances there would certainly be a blow down or back draught; and, as regarded the system mentioned by Mr. Pringle, it would do tolerably well in fairly good weather, but in a stormy wind it would not do at all. He did not think there was much force in the objection urged by Dr. Nicol, as however quiet the day might seem on the level, there would always be a sufficient current on the house top to start and maintain the up draught.

Mr. TURNBULL exhibited what he claimed to be "an improved form of actinometer." It is of tin, about the size of an ordinary snuff box. On the lid, which is glass, is pasted a series of thicknesses of *papier minéral* arranged in the ordinary way. The sensitive paper is wound round a roller, and may be pulled out as required. So far as could be made out from the description, the principal novelty is the coating of the *papier minéral* with a film of collodion to protect it from being stained by the silver on the sensitive paper.

A number of really fine examples of the work done at the out-door meeting in Cadzow Forest were then shown by Messrs. ANNAN, of Glasgow, PANTON, Pringle, Mathison, Sinclair, &c., &c. Mr. ANNAN, who had wrought wet collodion, showed some brilliant pictures, groups both of men and cattle, and the cattle of both Messrs. Panton and Pringle, both from dry plates, were also first-rate.

Two motions, one by Mr. Sinclair, that medals be given under certain conditions for the best work of the season taken at the out-door meetings, and one by Dr. Nicol, that a medal be given for the best paper read before the Society, elicited a considerable amount of discussion, but both were ultimately withdrawn to enable the members to consider the subjects more fully.

The SECRETARY then reported that the Council had considered the letter from the Glasgow Photographic Association, requesting the co-operation of the Society in opposing the extension of Mr. Swan's patent for the manufacture of carbon tissue. The Council had fully considered the subject, and on the ground that the Society had invariably declined to entertain any question connected with the commercial aspects of photography, recommended that no action should be taken in the matter. After considerable discussion it was resolved to approve of the report, and the Corresponding Secretary was instructed to communicate the resolution to the Glasgow Photographic Association.

Dr. JOHN NICOL, in the name of Mr. Gutekunst, of Philadelphia, presented the Society with a large portrait of "Longfellow," of the same exquisite beauty as the smaller pictures shown by that artist at the late Exhibition. He also submitted for the inspection of the members a number of cabinet pictures, duplicates of those exhibited, and by Mr. Gutekunst's request, invited the fullest criticism of all. He reminded the members that there had been considerable diversity of opinion regarding the quantity of retouching on the exhibits of Mr. Gutekunst, and that a large number of the members thought that a mistake had been made in characterizing the pictures as so wrought upon as to place them out of competition with ordinary photographs. On the authority of Mr. Gutekunst himself, he stated that, with the exception of the lady with the hat and beads, the whole of the specimens shown were untouched prints from untouched negatives, and as most of them were duplicates of those in his case, the members might examine them for themselves. He, Dr. Nicol, had done so very carefully, and had no doubt that they were really what Mr. Gutekunst claimed for them.

Mr. TURNER was glad of the opportunity of expressing his opinion of the wonderfully beautiful pictures of Mr. Gutekunst. He had examined them particularly when they were in the exhibition, and was satisfied that there was very little retouching. In point of fact, they did not require it. They were printed with extreme care from almost perfect negatives, and the system of glazing gave a depth and transparency that had, by its rare beauty, misled those who considered such an effect due to excessive so-called modelling. He might add that this opinion had been fully expressed to one of the judges at the time of the Exhibition.

Mr. W. NIXON expressed himself much pleased with the pictures, and quite agreed with Mr. Turner in thinking that their extreme beauty had cast a doubt on the method of their production. A more careful examination, however, would make quite clear the fact that they were really nature's handiwork, as they possessed natural beauties that no retoucher could imitate, but that all would certainly mar.

Dr. HUNTER had never seen anything in photography at all approaching in beauty to those pictures of Gutekunst's. He was also very glad to see that the general opinion of the members was that they were photographs pure and simple, as it would be a stimulus to each to try and do work equally good. Good sometimes came out of evil, and for his own part he did not regret the little misunderstanding that had arisen, as it had probably led to the presentation of the noble head of Longfellow, that would be a lasting memorial of the exhibition, and the discussion would undoubtedly show that in the opinion of the meeting they were specimens of the highest class of pure photography. He proposed that the Secretary be instructed to convey to Mr. Gutekunst the best thanks of the Society for the very handsome gift that he had sent.

The proposal was unanimously agreed to, and votes of thanks having been given to Mr. Laing and Mr. Turnbull, the meeting adjourned.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary (and last indoor) monthly meeting of this Society was held at the usual place of meeting, the Museum, Queen's Road, Bristol, on Wednesday, 2nd inst., Dr. THOMPSON in the chair.

The minutes having been read and confirmed,

The SECRETARY read a long expostulation from the Glasgow Photographic Association, relative to the Bristol and West of England Association's reply to that Society on the subject of the Carbon Patent, and which caused some little merriment.

Colonel Biggs, of Bristol, was elected an ordinary member of the Association.

Dr. THOMPSON then read his paper on the "Collodio-Albumen Process" (in our next), which was listened to with marked interest, and which was illustrated with some very fine pictures.

Mr. BRIGHTMAN asked if Dr. Thompson had tried moistening the film prior to development with alcohol, to avoid blisters?

Dr. THOMPSON stated that he had suffered scarcely at all from the film blistering.

Mr. BRIGHTMAN congratulated him, remarking that the most of the workers of the process found blisters a great enemy.

Dr. THOMPSON stated that to be quite sure that no hypo was left in the prints, he often soaked them in a solution of salt, which accomplished that end.

Mr. DANIEL asked if he did not find that by so doing the tone of the pictures was interfered with.

Dr. THOMPSON said he had not found that to be the case, and stated that many of those before the meeting had been so treated, and which certainly showed no signs of being reduced in tone.

After some further discussion, the matter of the "June Out-door Meeting" was considered.

Mr. HOLY proposed that it should take place on the third Wednesday in June.

Mr. DANIEL seconded the proposition, which was carried.

The HON. SECRETARY stated that at the Council Meeting held a day or two previously, every other detail had been decided upon; the date simply being left open. He informed the meeting that Tyntern had been decided upon as the destination, and that ladies and friends would be welcome, so that the excursion may be made as enjoyable and social as possible.

On the motion of Mr. DAVY, seconded by Mr. ALDRIDGE, a hearty vote of thanks was accorded to Dr. Thompson for his most interesting paper.

The meeting was then adjourned.

Talk in the Studio.

COLOURED ENAMELS.—We have recently been favoured by Mr. Burton, of Nottingham, with a sight of some coloured ceramic photographs of great delicacy. Mr. Burton is a portrait painter of old standing, who has for some years devoted his attention to photography, and especially to the production of coloured enamels, bringing his old experience in painting to bear on this branch of the art. Many of his results are very fine.

SECOND-HAND APPARATUS.—Those of our readers contemplating the acquisition of new apparatus of any kind will be interested to know that Mr. Morley has just issued a new catalogue containing a very complete list of all kinds of photographic requisites.

NEW COMBINATION PROCESS.—Mr. Woodbury, inventor of the well-known photographic printing process, has just perfected an adaptation by which the Woodburytype process is combined with chromo-lithography. The colours are printed in tint, only as for an ordinary chromo-lithograph, over which, in place of a key-block, an impression is taken from a Woodbury plate, so that the colours seem as if reflected through the photograph. The effect is that of a delicately coloured photograph in which remarkably transparent pigments are employed. In the example before us, a cottage with thick foliage in the background, the minute accuracy and soft tones of the photograph suffer no obscurity, but are as clear and as well defined as in an ordinary sun picture.—*Bookseller.*

To Correspondents.

CLAIMANT.—So far as we know, the best solution for mounting enamelled prints, without injuring their glass, is glue dissolved with the aid of alcohol. We have published in the *News* and *Year-Books* many detailed descriptions of the operations, but we cannot with any certainty say which is the best. Each method requires practice, and that method which any one masters will be to him the best.

LEO asks which are the best dry plates. Our answer to **LEO** must, in tone, be similar to the answer which we have given to a correspondent above. When he has mastered a process, he will probably consider it the best. It is quite impossible to say which is best in itself. That which is most within the range of your experience will probably be to you best. Most dry plate workers at present are disposed to consider the emulsion processes best; but it is probable that to **LEO**, inexperienced in dry plate work, they would present many difficulties. A bath process will probably best answer his purpose, and probably none better than the coffee process, as described in our last *Year-Book*, which is simple, easy, certain, and excellent in result.

L. F.—Your colouring has good qualities; but a little more delicacy would probably answer better for photographic portraits. Your style of manipulating and your colour are bold; but a little more precision and delicacy would probably be more valuable commercially. There is no directory of photographers. Your only mode of addressing them is by advertising. If you wish to distribute samples of your work, advertise your willingness to forward specimens to applicants sending their addresses to you.

JAMES GORDON, JUN.—A dipper of silver wire will answer well. A silver dipper may be left in a neutral bath, but if the bath contain much nitric acid it would gradually act upon the dipper. We prefer glass. 2. There is no benefit, but often positive injury in daily filtering the nitrate bath. The use of a dipper which does not permit the plate to reach the bottom of the bath, and which consequently escapes any stored-up deposit, saves a great deal in filtering.

F. WHISTON.—The addition of alcohol to a developer serves no purpose beyond making it flow freely. It has no developing action whatever. We very rarely add alcohol to a developer, preferring to secure the satisfactory flowing by manipulation. The question as to whether six or eight ounces of water should be used is very unimportant, as the slight modification in the strength of the developer will merely make the process of development more or less quick. One or two drops of nitric acid per ounce may be added, and will make the development somewhat slower, and possibly add a little to the brilliancy of the image. 2. The proto-nitrate is not a very stable developer, unless kept carefully from the air by means of a good cork. The enlargements you mention are very good indeed.

G. G. L.—The proposal to purify soluble cotton by boiling it in water has not, so far as we know, been extensively carried out. We think it is certainly worthy trial. It has been found that in some samples a substance resembling glucose has been formed, which is soluble in water, and this, of course, may become dissolved out in the nitrate bath, which it will injure. This would be removed by boiling, and perfect freedom from acidity would be insured. 2. Pyroxyline is better kept in a jar or tin box with a loose cover. It is more liable to spontaneous change when kept carefully stoppered. Good photographic pyroxyline is not perfectly explosive. It flashes and burns rather than explodes. That made at high temperature yields a collodion which does not keep very well.

M. F.—Daguerreotypes and collodion positives were tinted with powder colours prepared on purpose. It is possible to tint paper prints so, but they must be kept under glass, as the colour would be easily removed.

F. M. Y.—When a service is volunteered, we are bound in courtesy to wait the convenience of the volunteer. We hope shortly to be able to publish the information required, as the promise has recently been renewed to us personally.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. E. W. GOUEN, Walsall,
Photograph, Portrait of Self from Water-colour Drawing.
Mr. A. MADISON, Huntingdon,
Photograph of Sandringham Hall;
Photograph of Prince and Princess of Wales in Carriage and-
four at Kimbolton Castle.
Mr. W. H. MOORE, Bristol,
Photograph of Mr. Muller.
Mr. GABESON, Luton, Beds.,
Four Photographs of Mr. William Bigg.

The Photographic News, May 18, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

DEVELOPMENT OF SCIENCE BY WAR.—AMATEUR PHOTOGRAPHERS.—ASTRONOMICAL PHOTOGRAPHS TAKEN FROM HIGH ALTITUDES.—PRODUCTION OF COLOURED PHOTOGRAPHS.

Development of Science by War.—If science aids war, war may fairly be credited with developing science. One of the most beautiful illustrations of what science can do under necessity was brought forth during the Franco-German war, and had Paris not been so closely invested by an enemy we should never have dreamt of the possibility of a *poste aérienne*. The manner in which the mails were regularly carried out of Paris by balloon, and a return-post established by the aid of micro-photography and homing pigeons, is so happy an illustration of applied science, that one might almost go so far as to think well of a war which developed so interesting a matter. The tiny photographic films, so thin and delicate that a pigeon could of itself carry no less than a hundred thousand despatches, is a wonder hard to believe in; and yet these winged messengers that entered Paris during the three months that the capital was cut off from the rest of the world were about the only bearers of news that could escape the vigilance of the ever watching Germans. No doubt many birds fell a prey to Teuton marksmen, and many more were frightened away from their destination by the noise of the bombardment around the city; but by repeating the messages forty or fifty times, and sending pigeon after pigeon with the films until the receipt was acknowledged by balloon post from Paris, the beleaguered garrison was kept informed of matters passing outside. Letters, or rather despatches, were received in the ordinary manner for transmission into Paris by pigeon (of course, bombardment permitting) from all countries, the charge made being one franc per word. The despatches were set up in bold type, many hundreds of them printed upon a sheet, and this sheet was then photographed in microscopic proportions. Prints upon a thin transparent film were obtained, and these, on arrival at Paris, were put into an enlarging apparatus, similar to a magic lantern. At first, clerks were employed to copy out the messages thus reflected upon the screen, but afterwards the enlarged characters were photographed, thus obviating all clerical labour. Such a system as this would never have been elaborated but for the war, and while the French thus availed themselves of photography to help them out of a difficulty, their foes, the Germans, were not blind to the importance of the art in warfare. Maps published by the French *Etat-Major*, showing every road and pathway throughout France, were secured and reproduced by the Germans by photo-lithography. These copies were distributed broadcast throughout the Teuton forces, and there was not even a captain who did not know the nature of the country his company was passing through. Again, for surveying purposes, the Germans employed the camera to a great extent. Before Strasburg, and subsequently before Paris, a photographing surveying staff were busily engaged in making observations and completing surveys with the aid of the camera, and the information thus secured was of infinite service in the reduction of those fortresses. In respect to the present war we shall no doubt hear of further applications of science. We know that certain Russian officers have for some time past been busy in elaborating a process of micro-photography in the field, for reproducing secret despatches and plans of microscopic size, and among the equipment attached to the Russian army is to be found cameras and other photographic requisites. On the other hand, too, we are aware that the Turks have for some time past been anxious to obtain the services of an experienced chemist to help them in many scientific matters, and, above all, in the manufac-

ture of gun-cotton, dynamite, and other explosives. Both belligerents are seemingly quite aware, therefore, of the assistance which science can afford them in the struggle upon which they are engaged, and we may be assured that, however much we may regret the war, results interesting to men of science will not be wanting.

Amateur Photographers.—We spoke last week of the trouble and expense to which amateurs at times put themselves to secure good pictures. When an Englishman takes up with a thing, he rarely does it by halves, whether it is work or play that is in question; and we were told the other day of a wealthy amateur, living not a hundred miles from South Wales, who affords a good example of what some people will do for the sake of an art they love and cherish. This gentleman, whose grand pictures are familiar to all who have visited recent exhibitions in London, in his desire to depict a scene beside the railway, and at some distance from his residence, made no difficulty about securing a special train for his purpose. Arrived at his destination, he found, to his great vexation, that his assistant had omitted to bring with him his lens, and there was no alternative but to wait until the engine had been despatched, and had brought back the missing instrument. Such an example of steadfastness of purpose and devotion to the art is perhaps without parallel in the history of photography.

Astronomical Photographs taken at High altitudes.—Professor Zeugner has been making some photo-astronomical observations in the Engadine, in Switzerland. His work has been undertaken mainly in connection with the sun and its corona, and he seems to have secured some novel and interesting results. With a telescope having a focus only four times as big as the aperture, he obtained a picture of the corona in which this is represented as a broad round ring of one, or at the most two inches. Around it is shown an outer and weaker ring. The plan of making observations at an altitude so great as the Engadine will no doubt be followed after Professor Zeugner has shown the advantage of choosing such a station. The Engadine, as many of our readers may know, is a Swiss valley on the confines of Italy and the Tyrol, and celebrated for its dry, clear air. Moreover, the valley is situated 6,000 feet above the level of the sea, and while affording a wonderful point of vantage to observers, it has the merit of being a very agreeable spot to live in. There can scarcely be a doubt, one would think, that astronomical photographs taken at this height (2,000 feet above Ben Nevis), and in a district far removed from moist plains and from the vapours of towns, are far more trustworthy and clearer than pictures taken under ordinary conditions. If we are to have photo-astronomical observatories, and to base astronomic calculations upon the results, it is necessary above all things that the latter should be as true and undistorted as possible, and for this reason we consider that Prof. Zeugner, in taking the step he has done, deserves the thanks of all astronomers and astronomical photographers. To all appearances he seems to have secured a better record of the corona than any yet obtained.

Production of Coloured Photographs.—The production of coloured photographs by the superposition of a transparent image upon a tinted basis seems to acquire favour with the public. Mr. Woodbury, it may be remembered, showed some pictures of this kind ten or a dozen years ago, and within the last year or two M. Leon Vidal has been busily working a similar process, except that the latter uses greasy ink, we believe, for printing a photographic image over the coloured block. Within the past few months Mr. Woodbury has again come forward with the process, a cottage scene coloured in this way having come under our notice; and in Germany, or rather Saxony, a similar process evidently has just been patented under the name of *Bent photographie*. With competition in three countries we should soon obtain perfection.

SUMMARY OF DISCUSSION ON THE SILVER BATH.

BY J. SPILLER, F.C.S.*

FIRST let me congratulate the Society upon the interest awakened by the discussion of the silver bath, which has extended over three meetings, and been spoken to by nearly twenty of our leading members, who have recorded their experiences as to the best methods to be followed either in its original preparation or subsequent renovation. There has been, on the whole, a remarkable coincidence of opinion respecting the merits of the barium nitrate process, which, instead of emanating with the suggestion of Mr. A. L. Henderson, as I had at first supposed, is of far older date, and was first described, in the year 1865, by Dr. Hermann Vogel, whose original communication to the PHOTOGRAPHIC NEWS has been reprinted in a recent number of that journal (March 23rd), and which, I am bound to say, goes so fully into the whole subject, that nothing seems to have since been added to complete the summary of Dr. Vogel's observations. Mr. York, however, showed at the last meeting of the Society some clear negatives which had been produced from a bath that had been intentionally saturated with sulphate of silver. I can only reconcile this apparent discrepancy of experience by assuming that the bath conditions were favourable to the retention of the sulphate of silver in solution, and that when this salt exists perfectly dissolved in a bath, and not in a state of super-saturation, the evils in question do not manifest themselves. Perhaps I may be allowed to explain what I mean by super-saturation. It is well known that we may dissolve sulphate of soda in boiling water far above the point at which it will dissolve in cold water. If the hot liquor be allowed to cool in a perfectly tranquil state, free from all agitation, the salt still remains in solution. If, however, a crystal be dropped into the containing vessel, crystallization at once commences till all above the normal amount of the sulphate that is held in solution by cold water is crystallised. Supposing a bath to be super-saturated with silver sulphate, the mere fact of immersing the plate may cause a deposit of crystals to be thrown down. It is not surprising that sulphate of silver is found in the bath, when account is taken of the manner in which the iodides are prepared. For instance, iodide of potassium is prepared from pearlsh, which naturally contains a quantity of sulphuric acid. We believe that "pinholes" arise either from the formation of crystalline deposits in the film, which afterwards get washed off during development, or they are due to points of inferior sensitiveness caused by the depositions of relatively non-actinic particles (as, for instance, of the yellow iodide of silver), which obscure the action of light at the time of exposure, but, being loosely adherent, become detached from the plate during the subsequent manipulations. A turbid bath will, of course, show them at once, and so likewise will a bath charged to super-saturation with any of the difficultly soluble salts of silver, amongst which the sulphate is one of the most likely to occur from impurities in the collodion or sensitising salts, as was hinted on a former occasion.

Since opening the discussion, and describing the bath deposits of sulphate and cyanide of silver which had been sent to me by the Autotype Company, I have been favoured with two fresh samples from Mr. Bashford, of Portobello, one of which was forwarded to me through the Editor of the PHOTOGRAPHIC NEWS. They both proved to consist almost entirely of the carbonate of silver, and yet were said to have been filtered out of baths showing a slight acid reaction, and of good working qualities. This observation lends support to the statement which Mr. Brooks made at the last meeting: for he found the addition of an alkaline carbonate most efficacious in the removal of impurities which appeared to be carried down, especially on boiling, and that a bath so treated permitted

of very rapid exposures—an advantage which Mr. Bashford particularly refers to in his letter. The last-named gentleman reminds me likewise of the practice of using carbonate of silver to prevent discolouration of the printing bath, and of its conferring good keeping qualities to the sensitised paper.

Mr. Sawyer offers a good suggestion in proposing to use a dilute solution of chloride of barium for washing the pyroxyline, which, if carried out, must effectually remove all traces of free sulphuric acid from the collodion, and probably add to its permanence. Mr. Spencer recommends the use of bromide and iodide of barium as offering an absolute guarantee against the introduction of sulphates with the sensitising salts. There remains only the nitrate of silver to be carefully watched for the presence of sulphate, and this can easily be tested before use by adding thereto a solution of barium nitrate, which at once shows the presence or absence of sulphate of silver, if pure water be used for dissolving the crystals.

A good deal of evidence was stated in favour of the cyanide process of renovating the bath, Mr. S. G. Payne, Mr. Burton, and some writers in the contemporary journals, affirming its advantages. Mr. Blanchard had not found much benefit in its use, but, like Mr. England, placed more reliance in using common water and then sunning the bath. Mr. W. Bedford is in the habit of selecting the largest crystals, of his own preparation, for making the silver bath, and thus avoids the necessity for introducing barium or other extraneous salts.

FURTHER NOTE ON ALKALINE DEVELOPMENT.

BY CAPTAIN ABNET, R.E., F.R.S.*

IN a communication to the *Philosophical Magazine*, and which was reprinted in last month's *Photographic Journal*, allusion was made to the reaction that took place in the developer when employing alkaline development, but not being at the time in a proper state for publication I did not think it advisable to give the entire details of the reaction.

Having been anxious to ascertain whether external oxygen had anything to do with the reduction of the bromide of silver, I thought it advisable to cause the alkaline developer to come in contact with the silver bromide in exhausted tubes, and then to note the result. I will briefly recapitulate the method of procedure.

Pyrogalllic acid was carefully dried, a known portion dissolved in water, and made to cover some well-washed silver bromide of known weight. In the other tube was placed a solution of potash of known strength and perfectly free from all carbonic anhydride and from chloride. The tubes were then connected with a Sprengel pump, and after an aqueous vapour vacuum was formed the alkali was caused to run over into the tube containing the bromide and the pyrogalllic acid. After allowing the liquids and solid to be in contact for a time—in some cases a fortnight—the tubes were broken, the liquid filtered off the residue, that latter examined for metallic silver, and the former carefully evaporated down to dryness in an atmosphere perfectly free from carbonic anhydride or other atmospheric impurity. It may be stated that in as many cases the liquid was made up to a known bulk, and a portion of it set aside for estimating quantitatively the amount of bromine present. It invariably was proved that within the limits of error of manipulation, the bromine in the solution always agreed with the amount of silver bromide reduced to the metallic state.

In the paper above alluded to it is stated that the whole of the bromine combines with the alkali to form a bromide, and that whilst a residue given by the brown solution when evaporated to dryness is totally insoluble in

* Read before the Photographic Society of Great Britain.

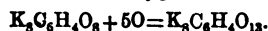
* The Photographic Journal.

absolute alcohol, the alkaline bromide can be dissolved out. In nearly every case this plan of treating the residue was resorted to. By so doing all excess of alkali was removed, leaving behind only that part which might be in combination with the organic salt. At first I was inclined to think that the pyrogalllic acid was absolutely decomposed into different compounds, amongst others, into carbonic anhydride, and that this was combined with the alkali.

I now find that such is not the case, for I find that acetic acid will not effect any change in the solution, no liberation of the carbonic anhydride taking place. If, however, nitric acid or sulphuric acid be added to it there is an immediate disengagement of the gas, and the brown colour of the liquid changes to a bright amber colour. It may be as well to state here that if this solution be evaporated to dryness we have a residue, part of which is soluble in alcohol, part in ether, and part insoluble in either. I have not thought it necessary to make an analysis of any of these, but the lesson learnt from it is that that compound, formed by developing, is readily split up into three others, together with carbonic anhydride. The next operation was the determining of the original organic residue. The combustion was undertaken in the usual manner. It was previously ascertained that each equivalent of pyrogalllic acid displaced four atoms of bromine. The following is a statement of results obtained directly on breaking the bulk:—



This is a compound in which five equivalents of oxygen are taken up. On exposure to the air, or after passing a current of oxygen through it, the new compound absorbs another five equivalents of oxygen, and we have—



The first compound formed is much darker than the latter, and something of the same phenomenon may be observed in dropping an alkaline solution in a moderately old solution of plain pyrogalllic acid, and the colour is first a deep brown, which, after mixing, the turbidity gives way to a more transparent and paler colour.

The examination was undertaken with solutions which answered to the strong alkaline developer. With weak solutions the reaction does not seem to be as complete; less silver is reduced proportionately to the amount of pyrogalllic acid employed. As far as I can tell at present, only one atom of hydrogen is displaced, and two equivalents of silver bromide reduced instead of four.

From the above it will be seen that alkaline development of an image is independent of external oxygen, and I may say further that the less external oxygen admitted the more complete is the reduction. If the developer be exposed to the air before application, as it is also whilst in the plate, another compound is partially formed which is less capable of reducing the silver bromide—in fact, acts as a retarder to the original solution. It may be for this reason that it is a safe plan, in developing a plate, to flow the developer over it, and then return it to the cup and allow the detail to appear. If the strong alkaline developer be allowed to remain on, the development is not so gentle, and there is a greater danger of veil. It must not be forgotten that the alkalinity of the pyrogalllic acid solution tends to make it absorb oxygen from external sources very rapidly, and that there is always the formation of the two compounds.

THE COLLODIO-ALBUMEN PROCESS.

BY G. S. THOMSON, M.D., F.M.S.*

THE collodio-albumen or Taupenot process, though one of the oldest of the dry methods, still maintains its place as

regards certainty and keeping qualities. Its other advantages are, that any slight error in exposure may be rectified in the development, and that the finished negative requires no coating of varnish, which of itself is no small recommendation. Its disadvantages are, the double coating, and the tendency to blistering of the film. The latter failing may be much, if not entirely, obviated by using new plates, or such as have not been repeatedly coated, and also by the employment of collodion yielding a powdery film. I find Kouch's "extra" answer well. The plates must of course be carefully cleaned, so as to possess a highly polished surface. I have never found it necessary to employ a preparatory coating of albumen, india-rubber, &c.

The plate is coated in the usual manner, and immersed in a thirty-five grain nitrate bath, the crystals being simply dissolved in distilled water; it is afterwards washed till the water ceases to show any turbidity, then drained on blotting-paper for three minutes, and the iodized albumen applied twice by flooding the surface of the plate placed over a shallow porcelain tray. It is then placed in a box on blotting-paper to ensure absence of dust, and allowed to dry. When dry, it must be heated over a spirit lamp till, by drawing the finger-nail round the edge, the albumen appears hard and horny; then allowed to cool, and immersed in the aceto-nitrate bath, consisting of—

Nitrate of silver ...	...	...	40 grains
Glacial acetic acid ...	...	...	40 minims
Water ...	...	...	1 ounce

It may remain here from two to five minutes. On removal wash as before, and when dry it is ready for exposure.

A great secret of success in this process is to give sufficient exposure. The plates I generally work with are ten by eight, with fourteen-inch lens focus. Under these conditions, and with half-inch stop, in sunshine I give eleven minutes.

I develop in a shallow glass tray, placing the plate face downwards, and supporting one side of it by a small strip of glass, so as to prevent its touching the bottom. By this means the developer remains clear to the end, and the surface of the negative is not stained.

I fix with hypo solution, to which I add adrop or two of acetic acid, just enough to destroy alkalinity and render it feebly acid, as with an alkaline solution blisters are very apt to arise. When dry, the albumen surface will be sufficiently hard to enable you to dispense with varnish.

The following is the formula I have used for the iodized albumen:—

Albumen ...	...	...	3 ounces
Aqua. dist....	...	...	1 ounce
Strong liquor ammonia ...	...	...	10 minims
Iodide of ammonium ...	...	...	10 grains
Bromide of potassium ...	...	...	10 "

Developer.

Cold saturated solution gallic acid	6½ ounces
Glacial acetic acid...	35 minims
Pyrogalllic acid ...	2½ grains
Solution of nitrate of silver (20 grains to ounce) ...	50 to 60 minims.

Do not add more of silver solution than is absolutely necessary.

THE CARBON PROCESSES.—A FEW HINTS TO LICENCEES.

BY LINDOP AND COOPER.*

Sensitizing.—At this season of the year one ounce of bichromate of potash to forty ounces of water is about the

* Read before the Bristol and West of England Amateur Photographic Association.

* *Anthony's Photographic Bulletin.*

proper strength. Immerse the tissue, the dark side upwards, and let remain (avoiding air-bubbles) until perfectly flat; then turn it over, face downwards, and let remain until the edges just begin to turn the other way; take it out in the way shown, and lay it face downwards on a clean piece of glass. Squeegee out all the excess of bichromate, and hang to dry in a perfectly dark room with the temperature at sixty or sixty-five degrees, and with a current of air through it, if possible.

The Tissue Becomes Brittle and cannot be Handled without Cracking.—To avoid this, as soon as the sensitized tissue is perfectly dry, place it in a large box as you fume albumen paper; place a pitcher of hot water at the bottom of the box; the steam arising will cause the tissue to become flaccid or limp, and will be as pliable as patent leather, and if placed in a tin box will remain so indefinitely. Never allow the tissue to remain exposed about the printing room, as it will surely become brittle again. After printing, mark them, and place in another tin box till developed.

Blisters Making their Appearance during Development.—If these be small they are caused by the water being too hot, especially at the commencement. It never should exceed ninety degrees at this stage. If they are larger they are more likely to be caused by small bubbles of air being imprisoned between the tissue and collodion by the squeegee, instead of being expelled by it, or from want of sufficient water on the plate while placing on the prints.

Tears and Dark Streaks Running down the Picture.—These are produced by removing the picture from the water during development and allowing it to remain in one position, so that the gelatine runs down in streaks and partially sets, and is not entirely re-dissolved by the time the development is complete.

To Retouch Spots on the Prints, or to give Fine Details in the Whites before Transferring.—Have by you a cup of hot water and a very fine camel's hair brush. Take a slip of plain tissue, give it a soak in the hot water, lay it on your palette and use it for colouring; warm your plate, use hot water with your brush, and you will soon be able to touch in the necessary parts so that you will not be able to perceive they were not printed. For increasing shadows on the print use powder No. 2 as explained.

Transferring and Mounting Full Gloss.—If at any time you find the transfer paper refusing to adhere to the print, immerse in a weak, hot solution of gelatine instead of warm water while transferring, instead of using starch or paste to mount full gloss. Take thin cardboard and immerse it in the gelatine solution used for transferring while still hot, and if anything a little stronger for mounting than transferring. When thoroughly saturated, mount it on the print when about half dry, rub it down well, put under a weight for half an hour, and let dry spontaneously. Or a surer way still is to make a good stiff paste with starch, strain it twice through cotton and squeezing it through with the hands; paste the dampened cardboard and prints with this, using a sponge instead of a brush to apply the starch; place under a weight for half an hour, and then dry.

Sundries.—Before placing the print on the glass to develop, examine the face of it, and by dashing on water you can remove any greasy appearance or dirt. See that the glass is thoroughly flooded with water. After squeezing the prints examine the face of them, and if you see glossy spots, be sure you have not had sufficient water on the glass.

Handle your tissue in a yellow light. Border all negatives, unless vignettes or medallions; the edges of these are already protected.

Try three or four on the photometer for your first experiment, and mark its own best number on every negative. By this means you need never lose a print. Keep the hands off the face of the tissue, as any finger mark will show.

Better to develop slow with water at ninety degrees, as if

too hot it produces harshness, and there is always a risk of cracking the tissue.

Use mineral powder No. 1 very sparingly until you get to thoroughly understand it. A little practice is all you require to retouch nicely.

In developing, if there be a very dense mass of shadow, which in any print would appear too heavy, this may readily be modified by taking a tuft of cotton-wool, soaking it in weak ammonia, and gently rubbing. You will be surprised how easily the mass yields to this treatment without destroying half tones. Pour a stream of cold water on the picture before putting it back into the water; this prevents the ammonia from adhering where you do not want it.

Fix with alum, and dry as slowly as you can conveniently. We place ours where they take about three hours to dry, without any danger of cracking. For placing on the transfer paper we think it best to let the plate lie tolerably level and float it with cold water. This prevents the introduction of air-bubbles better than dipping the plate in water.

We advise all our licencees to read the English journals. Carbon printing has taken such a hold in Britain that more than half the articles in the journals are devoted to carbon. All the best men, both professional and amateur, are contributors, and give just the information new workers in carbon require.

We hope soon to announce to our licencees the establishment of a firm in Toronto (which we have held for that purpose) to work in carbon exclusively, on the same principle as the Autotype Company in England, in enlarging and publishing for the trade and printing new hints and suggestions as their large practice and experience would give them; also giving licencees throughout the Dominion an opportunity of visiting and seeing the working of an exclusive carbon establishment. We also hope soon to start a Carbon Society, and publish a journal in its interest.

We have just bought from M. Lambert the remainder of the States, and as soon as we have disposed of them will devote ourselves to the advancement of carbon printing in Canada.

TREATMENT OF SILVER RESIDUES.

BY M. GEYMET.*

Of one hundred grammes of nitrate of silver consumed in the negative and positive process, only ten grammes are actually to be found in the negative and the print. The other ninety grammes remain in the washings, in the soda bath, and in the filters. How the silver may be recovered shall be described in the following lines.

1. The greatest amount of silver is to be recovered from the washings of the prints before toning. This water is poured into an earthenware pan, with any unserviceable silver baths and such liquids as may have been collected in the development tub—the waste iron and pyrogallie solutions, namely, which have been poured off the plates. In this earthenware pan are always kept some strips of copper, from which, from time to time, the grey silver powder which is deposited is removed. Into this same pan come other waste silver solutions and spent toning baths, but no liquids containing hyposulphite of soda in solution.

The pan should have a tap ten centimetres from the bottom. When the precipitate has settled completely, then the clear liquid above is allowed to run off. Every month the precipitate, which consists of almost pure silver, should be removed, and allowed to dry in a porcelain dish.

2. All papers which have come into contact with silver solutions—such as filters, spoilt sensitized papers, and unfixed prints—are collected and burnt to ashes.

* *Photographisches Archiv.*

3. The old fixing baths of hyposulphite of soda also contain much silver. These are collected in a tub or cask, which, like the pan, is fitted with a tap.

When the cask is about three-quarters full, there is poured into it a solution of *hepar sulphuris*, the same being stirred into the liquid by means of a wooden lath. The next day some of the liquid is taken out and examined in a test tube, a couple of drops of sulphide of hot potassium solution being added. If no precipitate results, it is a proof that there is enough sulphur in the cask already.

The experiment is repeated with a little more of the liquor, and this time a few drops of silver solution are added. As there still no precipitate, then it is a proof that there is too much sulphur, and more fixing bath must be added before proceeding further.

4. *The Melting of the Residues.*—The precipitates from the fixing baths are put upon a plate of sheet iron, and heated over an open fire. The other precipitates, resulting from washings, &c., are then mixed with the former, and thoroughly dried.

The dry precipitate is then mixed in the following manner:—

Dry precipitate	...	...	...	100 parts
Borax	...	...	...	50 "
Fused saltpetre	...	...	...	28 "

In fusing, the saltpetre is robbed of its water of crystallization. Crystallized saltpetre is put in a dish, and put upon a sharp fire. At first it fuses in its own water, then it dries, and a sharp fire will afterwards bring it into a state of fusion, and this fluid mass is poured out upon a stone. Saltpetre, after being fused in this way, is better than borax, the production of which is more difficult, although it is to be purchased in commerce.

With the above mixture an ordinary crucible is filled to the extent of two-thirds, and this is then put into the furnace. The muffle furnace employed for burning-in enamels answers the purpose admirably. Upon the lid of the crucible are laid a few pieces of charcoal, the furnace is filled with coke and charcoal around the crucible, and the crucible itself is filled up with the same materials. After the operation the crucible is broken, and there is found an ingot of perfectly pure silver which will dissolve in nitric acid, and from which nitrates of silver may be obtained.

To fuse the ash, there are mixed:—

Ash	...	...	...	100 parts
Dried carbonate of soda	...	...	...	80 "
Sand	...	...	...	25 to 60 parts

The crucible is filled as before, and the operation proceeded with in the ordinary manner.

MY PRACTICE.

IMPROVED METHODS OF WORKING—A TANK FOR WASHING PRINTS.

BY A. J. SHIPLEY.*

DURING the past two years I have operated in about twenty different galleries, stopping a few weeks in a place. Now, to make the thing practical, for that is just what we want, we will take the whole as one instance, and will call the operator or proprietor, John.

Well, John gets a fresh supply of chemicals, and drops us a card to come; he is ready to turn a new leaf. We drop in, take a survey of things generally, and go to work. We find the walls covered with receipts for collodion, developer, redeveloper, &c. Ah, John! too much formulae, one is all we undertake to work; that one was published in the *Bulletin* in September, 1874, except we modify it a little.

* Philadelphia Photographer.

We clean and scrub the dark-room. On the developing stand, in addition to the ordinary iron developer, we find pyrogallol and citric acid, bichloride of mercury, iodide, sulphuret of potass, and ammonia; all of which we have John carry down and out. Now we weigh out one ounce of fresh iron, which we dissolve in twenty-three ounces of water, add one ounce of acetic acid, and filter carefully. The bath stands at forty; we reduce it to thirty grains; collodion, after our old formula, except to every five ounces we add one ounce of plain collodion. Now all things are ready, and the first sitters are called in, and we proceed to the operating-room; here we find one of John's worst enemies, a white side-screen seven by nine feet square. We set it behind the background to get it out of the way quickly, and make a small frame two by four feet, cover one side with white, and the other with black muslin.

Our subject was a beautiful young lady, light hair and blue eyes. Now, to kill John at once, I turned the dark side of the screen to the sitter, and arranged the light so that an even flow crossed the face at an angle of about forty-five degrees. A plate was sensitized, the exposure given, and John rushed to the dark-room to see a (weak one as he supposed) negative that was sensitized in a weak bath with weak collodion, and to be developed with a weak developer. But when the developer flowed smoothly over the sleeping and invisible image, she awoke, and started into life, and kept coming till John shouted, "Stop, or she'll get away!" Now we had the first good negative John had ever seen taken.

Our next subject was a baby eight months old, and full of play, a fond mother, and two assistants; by some mishap, they all got into the operating-room. The baby does all right, but mother—well, the exposure stops at about three seconds. Again we proceed to the dark-room. This time setting the plate-holder aside, while I warmed the developer up to about 80°, also giving the plate a few minutes between the exposure and development, again we proceed to develop the image. Cupid came more quickly than John expected, but stopped before quite up to the standard; now I had at hand for the purpose a one-ounce (wide-mouth) bottle, in which I drained the plate; by so doing, I caught a few drops of free silver from the edge and back of the plate; with this I proceed to run the development a little further.

"Now what is to be done?" said John.

Never mind, John. We'll wash the little fellow; the negative, I mean. In this case the modulation was good, only lacking strength; to strengthen or intensify, as you please, we set it up in the window in a soft light before fixing; after exposing it to light one or two hours, it had the appearance of a negative intensified with permanganate. In this way I treat all my negatives that need any strengthening. By masking or protecting in various ways, any part of the negative may be brought up, gradation in backgrounds, one of a group, &c. In summer, be careful to set the collodion side next the window glass, else the flies will run over it with their dirty feet and speck the film.

Since we are not all able to buy a carbon process, owing to the enormous price, I will give my brethren a simple method of washing silver prints, thus making them sufficiently permanent to last, at least till able to buy something better if such it be. Make a tray eight inches deep, as large other ways as required; make a light frame that will just drop inside the tray; in each corner of the tray place a block of wood one inch square and three inches long, so as to raise the frame three inches from the bottom. Now get a net used for catching minnows, stretch over the frame, and fasten; for very large trays it will be necessary to have several large cords crossing underneath the net, to keep it from sagging too near the bottom.

The use of this apparatus will be too apparent to need further comment.

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VIGNETTING CARBON PRINTS.

ONE of the common objections made by portraitists to the carbon process has been based on the difficulty—or impossibility, as it has been alleged—of vignetting a portrait printed in carbon. To vignette a print efficiently, it has been judged necessary that the process of printing could be watched, an operation not possible, of course, in printing in pigments. Mr. Greaves, of Halifax, has, however, demonstrated that vignetting can be managed in carbon printing most efficiently and expeditiously. We have been favoured from time to time with very charming carbon prints produced by Mr. Greaves, which, to being very fine examples of this mode of printing, have added the charm of artistic vignetting, the background tint merging into a grey margin, instead of the baldness of a white margin, the gradation or merging of background tints being in all cases most soft and satisfactory. We were informed by Mr. Greaves that he had a system of effecting this, and during the course of the past week he was good enough to demonstrate his method for our edification, having patented his method and the printing-frame by which it was effected.

We should explain at the outset that this method is devised with an especial view to rapid, as well as artistic working. The primary aid in the matter is a printing frame designed for printing nine card negatives or four cabinet negatives at once. The negatives to be printed together are, in the first instance, selected of similar printing density. These are arranged in the printing frame and fixed in definite position in an inner frame. A piece of sensitive tissue, carefully cut to a fixed size, corresponding accurately with the size of the inner frame, is then laid on the negatives, and the printing is commenced. But if the prints are to be vignettied, another frame, fitting outside, is placed on the glass of the printing frame. This frame is fitted with the vignetting arrangement, which consists of a series of pear-shaped apertures with bevelled edges, allowing the light to reach the print under the graduated edges. We should explain here that all the inner frames of the printing frame fit very accurately, and register quite perfectly with each other, their various apertures corresponding perfectly with each other and with the negatives underneath. In printing, the whole of the nine negatives may be of the same printing value, so that the indications of the actinometer serve for all; or they may be arranged in threes, each row of three having its specific printing value, in which case, three different actinometer indications must be taken, and when the row of quickest printers is done, it is covered up until the others are completed. When the printing and vignetting is completed, the frame of vignetting masks is

removed, and is replaced by a corresponding frame of tints. These consist of a pear-shaped mask of wood, corresponding with the pear-shaped opening in the vignetting masks, possessing bevelled edges like the latter. These masks fit accurately upon the places where last the apertures were. The wooden masks are fixed upon plates of ground glass, through which the margins of the prints are tinted; the time being, of course, regulated by the aid of the actinometer, to a depth of tint ascertained by experience.

The perfect fitting of all parts of the frame and its lightness make the work exceedingly rapid and easy. The production of nine perfect prints, printing, double vignetting, transferring, and development, was effected in little more than an hour after five o'clock on a somewhat dull May evening.

One singularly ingenious arrangement in this printing frame must not be overlooked. It will at once be seen that, although by selection and the use of *papier minérale*, nine negatives of similar printing density might be secured, it would not be easy to secure as many pieces of glass of precisely the same thickness. To compensate for the varying thicknesses of the glass, the upper half, or lid, of the printing frame is provided with an air-bag as cushion to secure elastic pressure, and this, of course, accommodates itself so as to give precisely the same pressure to every negative, thick or thin.

It will be seen that the whole arrangement is as conducive to rapid despatch as to accuracy, the nine carbon prints we saw produced being much more rapidly completed than as many silver prints could have been in the ordinary mode of working: and Mr. Greaves proposes his frame for rapid and perfect vignetting in silver printing, to which purpose, of course, it is adapted just as easily as to carbon printing. It is, as we have said, protected by patent: in what manner the patentee will make his invention available to the public he will doubtless announce in due time.

POROTYPE.

POROTYPE is, we learn from the *Photographisches Archiv*, a newly-devised process for copying copper-plate engravings, wood-cuts, and other designs of a like nature. It is based on the principle that porous paper which has been printed upon by fatty ink loses, wherever ink attaches, its porous character. An engraving upon paper is only porous when there is no ink, and will neither allow gas nor liquid to penetrate wherever the black ink appears. A gas which acts upon a certain chemical agent, and either bleaches or discolours it, is permitted to penetrate a copper-plate engraving or wood-cut, where possible, and coming into contact, as it permeates, with paper which has been suitably prepared, brings about a reaction—that is to say, wherever the gas has found means to penetrate, the colour of the prepared paper alters, and a copy of the engraving is in this way produced.

In the process, therefore, four papers are necessary one, which is capable of generating gas, and which is soaked with hyposulphite of soda; a second, or sensitive paper, which is, in fact, paper treated, first of all, with extract of nut-galls, and afterwards with sulphate of iron solution (ink paper); thirdly, filter paper; and fourthly, oiled paper.

The copying of the engraving may be effected in the leaves of a book under pressure. The engraving is put upon the sensitive paper, and upon the engraving is laid the generating paper. Over these is laid a sheet of filter paper which has been previously impregnated in dilute sulphuric acid; then a sheet of plain filter paper; and lastly, the oiled paper. The whole is pressed together for ten minutes, when the copy ought to be finished.

A report upon the process by Professor Büttger is not very favourable to it.

THE PARIS DRY PLATE COMPETITION.

M. CHARDON'S PROCESS.

It will be remembered that last year the French Photographic Society instituted a competition among dry plate workers, and a prize of five hundred francs was offered by the Minister of Public Instruction, to be awarded to the author of the best process. MM. Ferrier and Davanne were charged by the Society to report upon the processes submitted, and according to the judgment of these gentlemen, which has just been printed, there appears to have been only one *bona fide* competitor. This gentleman, M. Chardon, has been awarded the prize. We extract from the report the details of M. Chardon's process.

The process of M. Chardon is distinguished by the preparation of a dry emulsion formed exclusively of bromide of silver enclosed in pyroxyline, by the absence of any preservative in the dry emulsion, by the great porosity of the film, by the addition to the alkaline developer of an intensifying liquid, which is added as soon as the image begins to show itself.

We will now proceed to the preparation of the products and the manipulations, emphasising the circumstance that in all delicate processes of this nature the very best materials only must be employed.

The pyroxyline employed must be of a horny, pulverulent nature, such as becomes dusty on handling. The cotton precipitated by boiling water seems particularly suitable for the process. The quantity varies with the solubility of the mixture of ether and alcohol. Under ordinary circumstances, the quantity of pyroxyline should be equal to the quantity of soluble bromide added to the collodion. If the pyroxyline is excessively soluble, larger proportions of it must be added. The bromides being always of a variable character so far as purity and dryness is concerned, it is necessary that they should be subjected to a preliminary operation.

Bromide of cadmium contains from twenty-five to thirty per cent. of water; you commence by drying slowly over a mild fire, agitating the while, until after a sort of fused paste has been formed you get the preparation in the form of a dry powder. Bromide of ammonium is dried in the same way, but with less heat; these are then weighed with accuracy in quantities in the proportion of their chemical equivalents, the equivalent of bromide of cadmium being 136, and that of bromide of ammonium 97. Thus, for example, 13.60 grammes of the first, 9.70 grammes are taken to produce 23.30 grammes of the double salt; and if one does not want to enter into calculations, you may simply double or treble, &c., these proportions.

The two salts are mixed, and dissolved in a small quantity of water; the solution is filtered, evaporated over a mild fire until it is perfectly dried, when it is put into a stoppered bottle, ready for use.

The bromide of zinc is, on the other hand, dissolved in absolute alcohol to separate the little oxide of zinc which is almost always mixed with the salt; the solution is filtered, evaporated upon a water-bath, and then heated over a fire until complete desiccation is reached; this very hygrometric product should always be weighed the moment it is dried: the equivalent of pure bromide of zinc is 112.

When these products have been properly prepared, the collodion is composed as under:

Alcohol	...	...	...	200 cub. cents.
Double bromide	...	...	...	6 grammes
Bromide of zinc	...	...	...	6 "
Pyroxyline	...	...	...	6 "
(Or more according to its solubility.)				
Ether	...	...	...	400 cub. cents.

It is well to prepare in advance a certain quantity of this collodion, which should be left to settle in order to acquire a perfectly limpid character. It cannot be filtered,

because the evaporation will produce changes in the proportions of which it would be difficult to keep count. For the same reason it is desirable to keep the bottle containing it hermetically sealed.

After standing sufficiently to clarify, you proceed to the process of sensitizing, and from this moment all the operations ought theoretically to be carried on in the dark, although practically an orange-yellow light, as feeble as possible, is employed. It is well not to sensitize too large a volume of collodion at a time; a hundred or two hundred cubic centimetres is enough to operate upon at one time. You commence by powdering very finely some pure fused nitrate of silver, and preparing separately the following:

Collodion	...	...	...	100 cub. cents.
Powdered nitrate of silver	...	...	...	3.10 grammes
Alcohol	...	...	...	30 cub. cents.

The nitrate of silver, accurately weighed in a balance that turns accurately to one centigramme, is put into a small flask, and to it is added one cubic centimetre of distilled water. The flask is then warmed until the silver is dissolved; half of the alcohol is added, and the flask again heated, and then the clear liquid is poured by degrees into the bromized collodion, taking care to agitate continually. Additions of alcohol are renewed in the flask, and then added to the collodion until all the nitrate of silver has been exhausted. The last portion of the alcohol serves to rinse out the flask. The bottle of emulsion is shaken vigorously, and then allowed to stand in the dark for thirty-six hours, being shaken from time to time.

Whatever the care taken, whether in the measurements or in the weighings, it is impossible to secure theoretical accuracy; but as the quantities here set down are quite precise enough, it is necessary to discover whether the conditions are favourable—that is to say, whether there is an excess of silver, and whether this excess is very considerable.

After thirty-six hours it may be presumed that reactions have come to an end. A small quantity of distilled water is therefore taken in a test tube (say ten to fifteen centimetres), and in the dark you pour into it about two cubic centimetres of the collodion to be tested. The mixture is shaken, then filtered through good white filter paper (Berzelius paper), the liquid being passed and re-passed through the filter until perfectly clear. To a portion of the liquid is added two or three drops of salt water, which should produce very apparent turbidity, a curd-like precipitate indicating a rather large proportion of silver. From the moment when the process of filtration begins you may operate in full daylight. It is only the bottle containing the emulsion which must always be preserved with the greatest care in the dark.

If the salt water does not produce any turbidity, you take, in another well-cleaned test tube, a further quantity of the liquid, and add to it a small quantity of a solution of silver. If turbidity or precipitate is formed, it is a proof that the collodion contains soluble bromide. It is necessary in that case to add to the collodion a further quantity of alcoholic solution of nitrate of silver, although it is always inadvisable to make this addition a second time; better is it to have an excess, rather than a lack, of silver.

If the collodion is proved to possess an excess of silver, it must be saturated, which is done by adding to every hundred parts of emulsion two to three parts of chloride of cobalt collodion, made up according to the undermentioned proportions:—

Alcohol	...	...	...	80 cub. cents.
Chloride of cobalt	...	...	...	10 "
Pyroxyline	...	...	...	2 grammes
Rectified sulphuric ether	...	...	...	120 cub. cents.

(To be continued.)

THE CARBON PROCESS OF TO DAY.

BY E. BATHO.*

SUPPOSING a piece to be sensitized with the precautions as indicated, the time occupied in its drying will permit of more attention being given to the negative, or rather the preparation thereof, than usually falls to its lot. With the utmost care, it seems impossible to produce a series of negatives that will print in equal times. Every printer in silver knows this, and accordingly humours his negative. One he will print in the sun, another in the shade, and carry out the thousand and one little niceties that serve to distinguish the mechanical printer who estimates his ability by the number of prints produced, and him who judges by beauty of result. In the matter of pigment printing a great power is denied—viz., that of watching the picture grow, as it were, into a thing of life, and thus use the light as the artist his brush. The only thing that appears to me to compensate for this loss is such modification of the negatives as will bring them into closer relationship in reference to density, so as to reduce as much as possible the chances of error in exposure during the subsequent printing, especially as its estimation must require more skill, seeing that in the case of silver printing the power of sight serves to correct the errors of judgment. Hence, so far as possible, bring all your negatives into such a state as to print in about equal time. To do this, the backing of the negative with tracing-paper seems an admirable way, and certainly is effective. Several thicknesses are sometimes required if a rather dense negative be chosen as the standard. Each must select this for himself; but for certainty of result, some method having this equalization of the printing quality of the negative seems to me imperative.

The actinometer next claims notice. The ordinary instrument is far from being what is wanted. Speaking personally, I have not yet found any two individuals to each register a tint, and, upon comparison, for them to be found of the same tone. This, however, does not interfere with its usefulness when it is always used by the same person, and estimated in the same light. Yet its want of sensibility is a great drawback. Still, this may be given to it by selecting a light tint as the standard for comparison; but the constant attention required would prove so irksome as to ensure neglect. The actinometer as used by Mons. Lambert is a much better instrument, and with a little modification answers every requirement, such change being a more sensitive scale. The intervals between the tints are too great for ordinary use. Where the more sensitive scale is employed, the eye gives an alarm in sufficient time to prevent any serious evil from over or under printing.

From the nature of my heading, it seems but natural that I should go on to describe every detail involved in the carbon process of to-day. Such, however, would be a waste of space, seeing that we have a manual that for clearness of style is equal to all instructions given in such form. This must be an excuse for what might otherwise appear unaccountable. My efforts will be directed to such details as I found in practice to aid me in overcoming difficulties in pigment printing.

The printing of the tissue can on most unimpeachable authority be left to mere boys, *provided everything is so left as not to need any more attention than you may expect of boys.*

We now come to the preparation of the plate which is to form the support upon which the picture is to be developed. How this is done when it is intended to form the permanent basis need not occupy our attention. When used simply as a temporary support, conditions must be maintained that may be stated as follows:—Some material must be placed between the gelatinous film and the support that has enough adhesive power to hold the picture to the glass during the operations of development, &c.,

but not sufficient to cause permanent attachment. Simple though this seems, yet it is here where I think many, if not most, of the early failures were made. Beeswax is the material generally employed. The methods of using have been various, but a solution of the wax in benzole when rightly employed leaves nothing to be desired. There is one danger that must be carefully guarded against, and that is the removal of the fatty layer during the subsequent coating thereof with collodion; but little notice seems to have been called to this, yet when it is stated that beeswax is soluble in ether, and partially so in alcohol, but little surprise will be shown at the statement that the fatty layer can be, and sometimes is, removed in the operation of collodionizing. The remedy for this is twofold: first, a saturation of the collodion with the wax (a means, by the way, of avoiding the trouble of waxing), or an extremely alcoholic collodion. The latter of these methods I prefer. Attention to this will ensure an absence of all sticking tendencies.

The mounting of the exposed tissue on the prepared plate is an operation requiring some amount of skill, yet, withal, extremely simple, the perfect exclusion of air being an absolute necessity. The temperature of the developing bath has been stated with figures somewhat varying: with recommendations to commence development with hot water, and end with cool, again with cool and end with hot, to use cool entirely or to use hot entirely, one is apt to get confused. A simple and reasonable rule is as follows: *Develop at a temperature 5° Fahr. higher than that temperature found to dissolve the unsensitized tissue.* An observance of this ensures the maximum half-tone, along with purity in the high-lights.

(To be continued.)

GERMAN CORRESPONDENCE.

VIOLET LIGHT IN ATELIER—INTENSIFIER WITH SALT OF LEAD—PHOTOGRAPHY IN THE HUMAN EYE.

BY DR. VOGEL.*

I SEE there is again some sensation about the new invention of Mr. Scotellari of applying violet lights in the atelier. It is always good when some new idea keeps photographers in agitation; but it is a pity when such a new idea is nonsense. Mr. Gaffield has spoken about this matter in a very plain and unambiguous manner, and has irrefutably shown by his experiences that the transmission of beams through a violet glass is of less chemical effect than through a white one. But there can be made the objection that Mr. Scotellari uses no violet glass, but a violet varnish, and that is in fact a great difference. The ordinary violet glasses are strongly coloured with manganese, which produces in the glass no colour of a clear spectrum-violet, but a mixture of blue and red. Through those glasses but very little of the clear violet of the spectrum is transmitted. The result with Scotellari's varnish may possibly be quite different. I have had no chance yet to examine the same spectroscopically; but probably it contains some kind of aniline violet—perhaps methyl violet, which in fact transmits the chemically effective light a great deal better than violet glass. According to that, Mr. Gaffield is perfectly right when he says it is impossible "that cutting off a portion of chemical rays by violet screens can shorten exposure and give more rapid chemical action." And he is so much the more right, as the most chemically effective light is not the violet, but the indigo blue at the line Z of the solar spectrum. I have made several hundred of spectral photographs, and am making them yet, but in all these works with bromo-iodide of silver, it was to be noticed that indigo blue very near Z had a stronger effect than violet. And now at least this matter has been examined by the committee of the Photographic Society at Paris, and one point is fixed, namely,

* Continued from page 222.

* Philadelphia Photographer.

that no shortening of the time of exposure under violet light can be noticed.

The committee worked in an atelier where half of the glass wall was covered with the violet lac, and has found out that the exposure on the side of the atelier with violet glass required just as long a time as on the side with white glass. And, after all, it seems as if violet light would be just as good as white light.

But the matter can be explained in the following way: Suppose we have an atelier without any curtains, one half with white, the other with violet glass. A person sitting in the violet part turns the face towards the white part, and receives, of course, a white front-light; but the person sitting in the white part turning the face to the violet part, the latter receives a violet front-light.

In the first case we have violet side and top light and white front-light; in the second case, white side and top-light, and violet front-light; and it can be easily seen that the result, under these circumstances, would be the same.

Some time ago I had a chance to report about the lead strengthening of Eder and Toth. In this method now some modifications are made which prove excellent for strengthening negatives of drawings where a thick cover is required. The plates should not be over-exposed, in order to have the lines as clear as possible, and developed, after which they are to be fixed immediately, and washed thoroughly. As a test of good washing we may let fall a few drops from the plate into a small quantity of a very weak solution of iodine tincture in water. When the solution does not discolour, the plate is clean. Then we have to lay the plate for about ten to fifteen minutes in a filtrated solution of four parts of nitrate of lead and six parts of red prussiate of potash in one hundred parts water. It turns therein to yellow-white, and consists now of ferrocyan-lead and ferrocyan-silver. These plates ought to be washed very clean, and may then be treated in several ways: 1. By pouring over them a solution of one part bichromate of potash in ten parts water. This solution we have to mix with one-quarter of its volume of ammonia. By this the white negative is changed into a yellow chrome-lead picture. Such plate seems to be very thin, but covers very well. We receive yet a better cover when we (2) add to the solution of bichromate of potash the same quantity of ammonia or a little more. Then the plate changes into chrome-red, and this cover will answer in most cases. But if we wish an entirely untransparent cover, we have to pour over the plate, after placing it in the lead solution and washing, sulphuret of ammonium, which will turn it entirely black and opaque. Strengthening by the latter is only necessary for photolithography. This strengthening is made use half of by my scholars and by myself, since the last year, with the very best success. But it is necessary that the collodion and silver bath work very clear, otherwise veiling will be produced. In order to receive very clean plates I usually add to eighty c.c. collodion one drop of nitric acid. Also it is important to wash the plates thoroughly after fixing them and taking them out of the lead bath.

Since some weeks the topics of conversation in photographic and literary circles are about some great discoveries in physiology. Parisian friseurs and coiffeurs are usually recommending their oil for the growth of hair with the following phrase: A discovery of immense importance has been made. The natural laws of the growth of the hair are revealed. And then follows the praising of the new hair-oil. But I have not to advertise a hair-oil, neither a photographic receipt, but I have to state only the fact that the natural laws of sight are discovered, and that after the discoveries of Boll and Kühne the sight of the eye is a photographic process. We have, in fact, a light, sensitive cover on the retina of our eye, the sight-purple. On this there occurs a photographic picture while looking at something, and, therefore, every person is a photographer, though no one knew anything about it.

Boll has proved that there is existing on the retina of the eye of each animal, of course of man too, a purple substance, which in the light soon disappears, but always regenerates, that is, renews itself by the process of light. In a yellow light the sight-purple is not changing, and Boll could on that account, in a yellow sodium light, better examine the relations of the same. He says: "We must imagine that while looking at something always some sight-purple is destroyed, and by some process renewed again, about which Boll has expressed his suppositions already."

Mr. Kühne succeeded in discovering that the reproduction of this coloured substance was the result of the contact of the retina with its natural underlayer. Among other proofs of this fact, he succeeded also in partly taking off the retina, bleaching it under the effect of the rays of light, and then, after carefully putting the bleached retina on its natural underlayer, saw the purple appear again after some minutes. Mr. Kühne succeeded repeatedly in this regeneration of the sight-purple, but it occurs only in a live condition. If the underlayer of the retina lost its life, the bleached purple does not colour again.

After these facts it was to be expected that we would succeed in the fixation of the little pictures which by exterior objects are produced on the retina of the eye. The first positive success in this direction Mr. Kühne had on January 15th. Afterwards he succeeded with a whole series of favourable results in photographic trials, of which we will describe only one.

A rabbit, after being excluded from the light for about five minutes, was placed in live condition towards the only window of a room. The distance between the cornea and the illuminated first row of window-glasses was 1.75 metre. After an exposure of three minutes towards the cloudy sky, the rabbit was decapitated, the eye taken out immediately, opened in a yellow light, and put in a solution of alum; and two minutes afterwards the other eye in the head was exposed to the window and treated in the same manner as the first one. Upon examination of the pictured eye-bottom no impression could be seen on the fine rose-coloured, moist, and shiny-looking surface. But after remaining in the alum solution for twenty-four hours, the result was astonishing. The back of the retina of that eye which was sensitized in live condition showed only a faintly visible impression, but that of the eye exposed while dying, gave the complete picture of the window, with six square panels and one glass cut round at the top, white on red background, with sharp red cross-work of the window. The picture showed downwards some perspective shortening of the upper row of the window-glasses and the arch of the window.

Plainer yet was the trial with the head of a just decapitated rabbit which was kept with one eye directed upwards to the top-light of the laboratory for about ten minutes, after which the head was turned and the other eye exposed the same length of time. After remaining for twenty-four hours in a five per cent. solution of alum, there were to be seen the most excellent pictures of the framing of the top-light on the exterior side of the retina of both eyes.

This discovery is wonderful enough; but for photography one thing is of special importance, namely, that the sight-purple is evidently a substance of astonishing sensitiveness. Our eye can distinguish very easily all details in the darkest corner of a room in a moment, while in photography it takes an exposure of hours to receive a poor picture.

The discovery of the sight-purple will lead perhaps to some other discoveries of substances very sensitive to light, which may be of great advantage to photography.

ALKALINE SILVER BATH.

THE Editor of the Photographic Society's Journal says:—

"In the late discussion on the silver bath, several members insisted on the alkalinity of the bath being of great importance, in order to secure rapidity, and from what fell from

them, the practice seems to be to use highly-coloured collodion; in other words, collodion in which iodine had been liberated. Where there is free iodine present, its contact with nitrate of silver must cause the formation of iodate of silver with a liberation of nitric acid, and it is presumable that this liberation of nitric acid in the film itself is more effectual in preventing fog than if the bath solution itself be acid. We have never met with a case in which bromized collodion shows a liberation of bromine; though such a liberation might take place unperceived, since with alcohol bromine forms bromal, a colourless compound, which it is as well to keep at a minimum if sensitiveness is a desideratum. Were bromal present in a collodion, there is much doubt if nitric acid would be liberated from nitrate of silver. Hence, with a bromized collodion the acid necessary to secure freedom from veil should be in the bath solution. When a large quantity of bromide is used in comparison to that usually adopted, though there is but little chance of liberation of bromine, and though there may be free iodine in the collodion, it may happen that this will not liberate sufficient nitric acid to secure cleanness in working, in which case also it would be necessary to use acid in the bath solution.

Correspondence.

STRONG AMMONIA DEVELOPER.

Sir,—This developer, now so much used in dry-plate photography, is directed to be made by dissolving one drachm of carbonate of ammonia, in powder, in one ounce of hot water, a process which involves—first, the use of scales and weights; second, of a pestle and mortar for pulverisation; and, third, the employment of hot water, and consequent injury to the resulting solution.

May I suggest a simple plan which I am sure dry-plate workers will appreciate (especially those who are away from home) of dispensing with all these difficulties?—viz., by adopting my own plan, which is simplicity itself.

Take a bottle of any size, and half fill it with fragments of carbonate of ammonia; fill the bottle with common water, cork tightly, and shake occasionally. When developer is wanted, take any quantity of this saturated solution and dilute with half its bulk of water, and as one ounce of water will dissolve about ninety grains of ammonia, this solution will, of course, contain one drachm to the ounce.

I fear this simple suggestion will provoke a smile from your scientific readers, but from its very simplicity it may not have been thought of by many.—Yours sincerely,

PHOTO-CHEMISTS.

PHOTOGRAPHY IN MELBOURNE.

Sir,—Though not a subscriber, I have for years been a constant reader of your journal, so that I trust you will allow me a little space to correct a communication you published from Mr. Cherrill some two months since. He speaks of Melbourne and its photographers—the want of art culture and taste so noticeable in their compositions. He says that the prices are low, and the pictures not good, and that he is of opinion there is room for a really good artist. Now, to come to facts, Melbourne is over-run with photographers, who find it as much as they can do to make ends meet. Their names are as follows:—B. W. Burman, T. Noble, A. Davis, C. Soden, J. Beaumont, W. Davis, C. Perry, G. Hewitt, J. B. H. M. Atrey, G. Shurt, Johnstone, O'Shannessy and Co., T. Chuck, F. Hasler, Benson and Stevenson, W. Sharp, J. Hilding, R. Wren, T. Bardwell, F. C. Burman, American Company, Batchelder and Co., Foster and Martin, C. Tanner, C. Nettleton, E. Pollard, Paterson Brothers, A. Goulter, J. K. Brennan, S. Nathan, D. Wood, McAlpine, Van Houten, McDonald, Bear, Hall, and Steward and Co.—in all, thirty-seven.

You will, I am sure, agree with me that Melbourne is at present amply supplied with photographers.

My only object in writing is to prevent any man coming out here thinking to find an opening, and, after crossing the ocean, discovering he is the victim: a too elegantly worded letter.

As I am totally unknown to you, doubtless you will feel cautious about accepting my statement; but if you communicate with Mr. Mayall, of London or Brighton, I am certain he will corroborate my letter in every particular. Thinking there was an opening, he came out here, and invested a large sum of money in the erection and furnishing of a studio, but did not find out until it was too late that Melbourne was overstocked with portrait takers. He returned to England, last year, much poorer for his trip.

It is a great pity that Mr. Cherrill did not personally ascertain the truthfulness of the information offered him before committing it to paper, thereby, perhaps, inducing some adventurous person to emigrate to this Colony.

The price of cartes is seven shillings and sixpence per dozen. One house charges ten shillings and sixpence; but the ruling price is seven shillings and sixpence. The pictures are very fair, and one house, in particular, turns out pictures equal to anything I have seen from London and Berlin, and they only charge seven shillings and sixpence.

Mr. Cherrill then goes on to state that operators receive from four to six guineas weekly, and in some cases eight guineas. It is pretty clear that he has been made the dupe of some practical joker, as there is not a single operator getting more than four pounds, the salaries running from two pounds to three pounds ten shillings. Out of the thirty-seven photographers in business, thirty-three employ no operator, only an assistant being required in the dark-room, so the remaining four firms cannot find sufficient employment for the number awaiting situations.

Mr. Cherrill's communication is so temptingly worded that a young man might be induced to venture so far from home in the hope of securing a permanent and lucrative billet; but there are at present several talented young men positively begging for a situation.—Apologising for the length of my note, I remain, yours truly, FINE ATKINSON.

3, Denials Terrace, Church Street, Richmond, Melbourne.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The second out-door meeting of the season was held on Thursday, the 10th inst., the scene of operation being Bothwell Castle.

Assembling at the West End station at 8.30, the members took train to Hamilton, where conveyances were waiting in which the drive to Bothwell was accomplished. The weather for some days previous had been dull and disagreeable, but the party were hopeful that a slight breaking up of the clouds indicated an improved state of matters as probable. In this they were not disappointed, as by the time the Castle was reached the sun had appeared with all his cheering influence on the would-be landscape photographers. The day, however, was not by any means favourable for photography, as during the whole course the wind blew a pretty stiff gale, the result of which was not only the limiting of the subjects to such as were least affected by it, but, in more than one case, the over-turning and seriously injuring of the cameras.

Bothwell Castle stands on a beautiful green bank, high above the Clyde, and is considered one of the most magnificent ruins of its kind in the country. It measures some two hundred and thirty-four feet along the summit of the bank, terminating at each end in a lofty massive tower with walls over fifteen feet in thickness. The date of its foundation is lost in the obscurity of the past, but it existed as a great baronial stronghold in the days of Wallace and Bruce, and was for some time inhabited by Edward III. of England.

Members attending such out-door meetings, especially those who work large plates, know how desirable it is that the party should include a few friends without cameras ready to lend a hand in carrying the apparatus from place to place. That it is not

always well to trust in such aid, however, was made manifest by an incident that occurred at an early period of the day, and which rather damped the spirit—for a time, at least—of one of the party. As the members assembled at the Caledonian Station, the traps were disposed of in various compartments, there not being a carriage in the train to hold all present, and when the necessary change was made at Hollytown each seized on as much as he could carry, altogether irrespective of ownership. Trusting to the united action to have transferred everything to the train on the Hamilton Branch, they went on their way rejoicing till they arrived in that town; but on taking stock, after being seated in the conveyances, the unpleasant discovery was made that one tripod was missing. A hurried run back to the train resulted in the information that the truant tripod would by that time be far on its road to Greenock, and could not certainly be available for that day. But photographers, perhaps more than any other class of the community, have a friendly fellow-feeling for each other in case of difficulty, and some of the party, remembering that Mr. Birrell, the inventor of the oxyhydrogen apparatus, lived in Hamilton, suggested an application to him and he most kindly supplied the needed article. *Morale*: While making use of friends to assist in carrying our apparatus, don't trust to them to see that nothing is left behind.

Bothwell Castle and its surroundings afford ample scope for much picturesque work, including, as they do, the grand old pile, groups of noble trees, and beautiful windings of the Clyde; but in consequence of the time lost in the search for sheltered nooks and corners, a comparison of notes at the end of the day showed that only thirty-nine plates had been exposed. It is, however, gratifying to state that, so far as we have learned, they have nearly all turned out well.

At five o'clock the party drove back to Hamilton, where full justice was done to a good dinner prepared by mine host of the Commercial Hotel, and, starting at 8:30, they reached Edinburgh shortly after ten o'clock, thoroughly pleased with the enjoyment of the day.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE last meeting before the vacation was held at the Memorial Hall, on Thursday evening, the 8th inst., ALFRED BROTHERS, F.R.A.S., President, in the chair.

After the routine business had been disposed of,

Mr. POLLITT read a paper on "Swing-fronts *versus* Swing-backs."

Mr. COVENTRY exhibited a swing-front made by himself to illustrate a principle suggested by Mr. Woodbury.

Mr. D. YOUNG read a short paper on "Another Improvement in Making Oxygen," and exhibited the retort in action.

Mr. NORON said that the specific gravity of oxygen plugs was greater than that of the same mixture in powder, and, bulk against bulk, yielded more gas.

Mr. W. J. CHADWICK showed his oxygen machine, improved so as to be absolutely safe, and made some gas to exhibit the action of the spring arrangement in his retort.

THE PRESIDENT exhibited an instance of a negative having been changed into a positive by the action of light before fixing; also a Daguerrotype plate iodized about twenty years since, which he accidentally found was still sensitive.

Mr. J. B. ROBINSON had sent a sample of waterproof paper suitable for the making of developing tray, also a tray of the same material which had been full of water half the day.

Mr. CHAPMAN exhibited a specimen of glass-wool, which he said was useful for filtering purposes.

Mr. COOTE showed some good examples of clouds printed on ferro-prussiate paper, which he used as a sort of index for his cloud negatives.

Mr. POLLITT exhibited some of his splendid interiors of the New Town Hall, taken on wet plates, with a swing-back camera. Some of the negatives were exposed five hours.

Mr. W. J. CHADWICK presented the Society with a pair of legs and a new box for the sciopicon, and was awarded a vote of thanks.

A similar compliment was paid to the other gentlemen who had contributed to the interest of the meeting.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE third annual meeting of the members was held at 174, Fleet Street, on Monday, May 7th, Mr. W. S. BIRD in the chair. The minutes of the previous meeting having been read and authenticated, the Secretary was called upon to read the report and statement of accounts for the past year. After a few remarks from the Chairman, the report and balance-sheet were adopted.

The meeting then proceeded to the election of officers. The following gentlemen were elected:—

Vice-presidents.—Rev. F. F. Statham, M.A., F.G.S.; J. H. Dallmeyer, Esq., F.R.A.S.

Treasurer.—H. Baden Pritchard, Esq., F.C.S.

Auditors.—G. Taylor, Esq., Mr. Sisman.

Board of Management.—W. S. Bird, Esq. (Chairman), Mr. W. M. Ashman (Deputy Chairman), Messrs. W. S. Atwood, H. J. Burton, T. Bolas, J. D. Tague, J. A. B. Hall, T. S. Hicks, E. Lavender-Rheinslander, H. J. Thorne, and S. Tyler.

The Board of Management having selected the candidates from the number of applications for the post of Secretary, each candidate was separately questioned by the Chairman and Members respecting their ability to fulfil the office if elected. Upon their retiring, the votes were unanimous for Mr. Harland to be Secretary for the year ensuing, and to be remunerated by a small salary and commission. As a further means of enhancing the funds of the Society, the Chairman advocated the employment of a paid agent to introduce the features of the Association in the provinces, as the objects of the Association were not thoroughly understood in many places. It was finally resolved that the Chairman be empowered to arrange with a competent traveller to canvass for members and donations in the provinces, and that the remuneration should be in form of commission.

Some members then advocated some alterations in the rules. Finally the following alterations were passed:—Rule 2. The word *profession* struck out and *Association* substituted, and add at the end, *to duly qualified applicants*. Rule 4. That *benefit* be inserted between *every* and *member*. That *two years* be altered to *twelve months*. Rule 5, line 5. That *twelve months* be altered to *six months*. Rule 10. The above alterations being carried, the fifth line from the bottom is superfluous, its erasure giving subscribers a preferable claim. Rule 16. That the Board of Management consist of *ten* members instead of *fifteen*.

After the usual vote of thanks to the Chairman for presiding, and to other gentlemen for their services during the past year, the meeting was adjourned.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 6th inst., M. PELIGOT in the chair.

THE PRESIDENT announced that he had received from H. E. the Russian Ambassador, the Minister of War, and from the Minister of Public Works, letters of thanks for the report which had been drawn up by the Society on the occasion of the last exhibition.

A letter was read from the Minister of Public Instruction enclosing authority for the payment of five hundred francs, being the prize promised for the best dry-plate process submitted. [This prize, it may be remembered, has been awarded to M. Chardon.]

THE SOCIETY requested the President to thank the Minister, and to take steps for the institution of another competition.

M. DAVANNE observed that the reason of the Government for favouring the elaboration of photographic processes was to be found in the fact that it was so useful for scientific missions.

This circumstance, the PRESIDENT said, should be borne in mind in any future competitions.

M. SAHLER forwarded a note relating to instantaneous photography.

M. DAVANNE, on behalf of the Duke of Chaulness, presented a print in colours obtained by the process of M. Cros.

M. ROBERT, the Director of Sevres Porcelain Factory, offered for the acceptance of the Society a porcelain portrait of M. Poitevin. The plate which had served as matrix was secured by the moulding and relief process indicated some years ago by M. Poitevin.

M. ANDREA called attention to a number of the PHOTOGRAPHIC NEWS containing an article by M. Peltz on the dissolution of lac in alcohol. Abstracts from other foreign journals were read by M. Andrea.

M. DAVANNE called attention to the nomination of a commission by the Minister of Public Instruction to discover how far the employment of photography in copying the various public collections depends upon that minister. M. Davanne read the report drawn up by M. Ferrier and himself, who had been nominated to award the prize for the best dry-plate process.

Afterwards the PRESIDENT handed to M. Chardon the prize which had been awarded him.

M. CHARDON thanked the Society, and gave a demonstration of his process before the members.

The proceedings then terminated.

Talk in the Studio.

ULTRA-VIOLET SPECTRA.—In a recent communication to the Belgian Academy, M. van Monckhoven describes some improvements in the photographic reproduction of ultra-violet spectra of gases. He employs two large Goussier tubes, placed parallel, and communicating together by a capillary tube at right angles to them. The spectroscopic consists of three sixty-degree prisms of Iceland spar, cut so that the bisector plane of each of their dihedral angles is parallel to the optic axis of the crystal. With such prisms the ordinary and extraordinary spectra do not encroach on one another. The axis of the capillary tube is then made to coincide exactly with that of the collimator of the spectroscopic, and the intensity of the light, which can be utilized during passage of the current from a Ruhmkorff coil, is found to be very much greater than if the tube were placed, as usual, perpendicularly to the axis of the apparatus. The author recommends using a plate of quartz in place of one of the large tubes of glass, as to prevent too great absorption of rays of high refrangibility. To give an idea of the exactness with which even the most refrangible bright lines are reproduced, M. van Monckhoven presented three plates representing the solar spectrum, the bright lines of hydrogen combined with those of aluminium (of which the electrodes were formed), and the bright lines of a solar protuberance.—*Nature*

A YORKSHIREMAN'S IDEA OF PHOTOGRAPHY.—The *Darlington Times* says:—"At the Stokesley County Court, a plaintiff who lives by retailing provisions at Lundale, near Guisborough, stated that the defendant in his case is a 'fittograffer chap.' On being questioned by the Registrar, he explained that a 'fittograffer' is 'a chap as takes shadders.' Judge Turner should publish some local jottings of his experience, which must be full of amusing incidents."

PHOTO-STEREOTYPING.—The name of photo-stereotyping is given to a new and its ingenious process of its kind just introduced. A sheet of ordinary plate-glass, larger than the picture to be reproduced, is coated, in a dark room, with a solution made by dissolving one ounce of potassium bichromate in fifteen ounces of water, warming gradually, and then adding two ounces of fine gelatine, and filtering through linen at the boiling heat. Now, a diapositive is taken from an ordinary negative, and laid with the collodion side to the gelatine face of the prepared plate, in diffused light, for ten to thirty minutes. The plate is then taken from the frame in the dark room, and washed with water for five or ten minutes till the relief is wholly developed, after which it is dried with filtered paper and coated with glycerine by means of a camel's hair pencil, and the excess of liquid is removed with filter paper. From the plate prepared according to this process a cast is made, in plaster of Paris, of the thickness or consistency of oil, and from the plaster cast thus obtained a metal one may be taken in the usual manner.—*St. Louis Practical Photographer*.

To Correspondents

FRED WARNER.—Mr. Robinson's "Pictorial Effect in Photography" is out of print. 2. Your question as to glycerine is too vague. You ask what quantity of glycerine is required to forty ounces of silver bath. As a rule no glycerine is required. It is not customary to add it to a silver bath. It has been proposed, under certain circumstances, to add a little. It has been proposed, in cases of long exposure in warm weather, when the silver solution is apt to dry upon the plate, to add a little glycerine to check such tendency to dry. The quantity in such case should be ascertained experimentally, beginning with, say, one ounce of glycerine to the forty ounces of bath, and adding more until the effect was obtained. 3. Registration will not prevent piracy; but it will, doubtless, tend to check it. Registration is a necessary preliminary to legal redress in case of infringement of copyright. We do not know of any studies of grouping you can purchase.

J. B. ROBINSON.—We are obliged for the sample of water-proof paper, which it is probable, we think, may be found very useful for many purposes in photography. Dishes, trays, baths, &c., may easily be built up with such a material, and we doubt not that various other purposes will be found as occasion arises.

CONSTANT SUBSCRIBER.—Your letter must have gone astray, as we have no queries with such a signature. Repeat your questions, and we will answer them.

DR. MANTELL.—Some samples of pyroxyline do not readily dissolve in ether alone, but dissolve at once on adding alcohol to the ether. Try adding alcohol. If the pyroxyline still remain undissolved, we fear that it is an imperfect sample, and unless it can be exchanged by the manufacturer, must be thrown away; we do not know of any method which will make it soluble. It is to be regretted that very few manufacturers of collodion care to sell pyroxyline, and hence there is no certainty of getting good samples. The best kind of pyroxyline for emulsions is that made at a high temperature with weak acids. We have always found it necessary to prepare our own pyroxyline when we required any special quality.

D. R.—The best mode of dissolving glass in spirit to make a mounting material is, first soak the glass, drain away all water, and dissolve by the aid of heat. Then add the spirit—methylated will serve—a little at a time, and keep stirring. It will, after becoming cold, require very slight warmth to redissolve it sufficiently for mounting purposes.

M. F. L.—When using very highly albumenized paper, which tends to curl very much when dry, it is best to mount the prints when slightly damp. It saves much trouble, and prevents the cracking of the albumen surface. When mounted, place the prints under pressure until they are rolled or burnished.

J. JUNK.—A single lens will answer every purpose for simple landscape work. The wide-angle landscape lens, of the maker you name, will take in quite as wide an angle as you require.

AMATEUR PORTRAITIST.—It is possible to produce portraits in the open air. Select, if possible, a place where direct sunlight is cut off by a building or wall, and, if possible, use a canopy overhead to shut off direct top-light. The skilful use of screens will effect much.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR APRIL.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE (IN THE SHADE).			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	30.81	29.84	29.80	44°	45°	43°	Fair, but cloudy
2	29.70	29.62	29.47	43°	46°	46°	Drizzling rain a.m. and p.m.
3	29.32	29.14	28.49	43°	47°	47°	Rain all day. Very windy at night
4	28.90	28.30	28.77	46°	55°	44°	Rain from noon. Heavy dark clouds
5	28.97	28.99	29.16	40°	52°	45°	Fair during the day. Thunder, with showers, at night.
6	29.22	29.27	29.30	49°	50°	40°	Fair, generally clear
7	29.38	29.39	29.40	60°	51°	45°	Shower in the afternoon
8	29.44	29.45	29.45	63°	54°	48°	Fair, clear, and sunny
9	29.41	29.42	29.40	60°	55°	47°	A little rain a.m. and p.m.
10	29.39	29.37	29.41	48°	56°	50°	Fair, clear, and sunny
11	29.55	29.58	29.76	44°	45°	40°	Fair and sunny
12	29.86	29.85	29.80	40°	48°	40°	Fair and clear
13	29.77	29.78	29.80	45°	45°	45°	A little rain a.m. and p.m.
14	29.95	29.96	29.99	47°	50°	47°	Rain a.m. and p.m. Wind at night
15	29.78	29.68	29.58	46°	56°	47°	A little rain a.m. and p.m. Very strong wind all day
16	29.47	29.48	29.60	48°	48°	—	Fair. Very strong wind. Gloomy
17	29.65	29.70	29.70	50°	43°	39°	Fair. Windy. Gloomy
18	29.68	29.67	29.79	53°	42°	40°	Fair, generally sunny
19	29.78	29.83	29.80	54°	43°	40°	Fair, generally gloomy
20	29.99	29.96	29.90	41°	49°	47°	Fair, but gloomy
21	29.70	29.61	29.50	45°	48°	48°	Rain a.m. and p.m.
22	29.15	29.40	29.34	—	49°	46°	Heavy rain at night
23	29.34	29.41	29.40	47°	51°	50°	A little rain p.m.
24	29.48	29.72	29.60	40°	57°	45°	Fair. Windy at night. Gloomy.
25	29.71	29.76	29.83	50°	58°	41°	Fair and sunny
26	29.82	29.83	29.84	40°	—	42°	Fair, generally gloomy
27	29.80	29.79	29.72	41°	53°	42°	Fair and sunny
28	29.76	29.76	29.74	44°	47°	43°	Fair, generally sunny
29	29.70	29.74	29.89	44°	44°	43°	Fair, but gloomy
30	29.01	29.04	29.16	43°	41°	39°	Fair, but gloomy

Summary.				Mornings. Noons. Nights.		
Highest temperature observed	...	...	...	53°	58°	48°
Lowest ditto	...	...	...	29°	41°	38°
Mean ditto	...	...	...	43.5°	50.3°	43.7°
Mean of all observations	...	...	...	46° 6'		

NOTES.—By referring to the above it will be seen that the temperature during the month of April this year has been considerably below the average. Although early in the year, the weather was very mild, yet as the spring advanced it has become more severe. The trees are ready to burst at once into foliage, but are being checked by the cold mornings and nights, and east winds, which even now prevail.

The Photographic News, May 25, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. MANUFACTURE OF CELLULOSE—PHOTOGRAPHERS' BENEVOLENT ASSOCIATION—OUR ILLUSTRATED NEWSPAPERS.

Manufacture of Cellulose.—It is generally supposed that the photographer, the surgeon, and the soldier are the chief consumers of all the guncotton that is manufactured nowadays. The vast quantities of collodion that are every day required to keep the photographer going in his work must alone necessitate the preparation of a good deal of pyroxyline, and, of late, the demands on the material for military purposes has largely increased the scale of its manufacture. But there is another channel yet for the consumption of guncotton, namely, in the production of a material termed xylonite, or, as a modification, is called celluloid. It is now some years since guncotton was first used in this manner, a sort of imitation ivory being prepared by its means, which is largely employed as a substitute for the veritable tuak. It is only recently, however, that any great energy seems to have been exerted in the matter, and while the factory originally established in this country is more busy than ever in the manufacture of guncotton articles, in America there are several such establishments in existence, one notably at Newark, in the United States, which is about to start a branch factory in Paris. As we have said, the material is now known generally as celluloid, and it is under this name that its manufacture is being vigorously prosecuted. It is moist guncotton, mixed with camphor, and probably certain white pigments to give it an ivory look, the product, when in the shape of brush handles, pianoforte keys, billiard balls, and the like, being hardly distinguishable from ivory, except in respect to its odour, which is of an aromatic nature. Instead of taking cotton wool or yarn for the preparation of the material, as is usually done in the manufacture of pyroxyline, it is pulp, or rather paper, that is acted upon by the acids in the production of celluloid. A roll of endless paper is made to unroll, and as it does so there falls upon it a liquid stream composed of five parts of sulphuric acid and two parts nitric acid. This mixture transforms the paper, or cellulose, into a sort of pyroxyline. The paper is then pressed to remove the excess of acid, and then washed to further remove all traces thereof. After drying, this endless sheet of guncotton is broken up in a mortar, mixed with camphor, put under high pressure, and dried in a hydraulic press between sheets of blotting-paper. After more grinding and pressing, it is obtained in beautiful transparent plates of a very elastic nature, in which condition it is ready to be applied to the many and varied uses to which it is put.

Photographers' Benevolent Association.—The Photographers' Benevolent Association has just issued its report for the past year, and we regret to see that the institution is not receiving the support from photographers in anything like the degree it deserves. We note that during the year seven cases of distress were relieved to the extent of £16 6s., while the subscriptions from ordinary members amounted only to £14 19s. 6d. There is still a balance in hand, we see, of £50, but this money is due to subscriptions from honorary members and other sources. The ordinary expenditure of the Association is heavy in comparison with the receipts, but it no doubt represents the minimum at which such an affair can be kept going, and we presume that if the number of members were increased tenfold, there would be no need for any augmentation in the expenditure. It is, however, for photographers to say whether the Association shall be a prosperous one or no, and certainly the number of ordinary members must be greatly increased before the body can exercise any great degree of usefulness. The benefits which the Association desires to secure to its members are, according to

the report, substantial relief when a member needs it; railway fares, to enable a member to reach a situation at a distance; and engagements for assistants out of work.

Our Illustrated Newspapers.—Painters and draughtsmen are so hard upon photographers at times that it is well occasionally to point out that the works of the former are not altogether immaculate. Sketches in our leading illustrated journals are contributed by men of some standing in their profession, and for this reason the pictures are usually regarded by the general public as just representations of the scenes they are intended to depict. But that this is not always the case is evident from two large pictures that have recently appeared. One of these represents the coal mine in the Rhondda Valley which was flooded some weeks ago, and the other showed the monster 80-ton gun immediately after firing. Everybody who read the exciting story of the release of the colliery from their entombment is aware that the tunnel which was cut so rapidly for their relief measured no more than two feet six inches, or three feet, in height, and that the men who cut the coal had to lie or crouch down while at their work. And yet we are shown, in the representation of the affair given us in the illustrated papers, a passage in which the men at work cutting the coal can not only stand upright, but have many feet above their heads to spare. The picture of the firing of the 80-ton gun at Shoburness is just as absurd. The gun recoils something like forty feet when fired, and jerks back at the moment of discharge with terrible energy, as may well be supposed when we remember that the amount of powder burnt at a time is upward of 300lb.; and yet we are treated to the picture of a man standing up behind the gun in the most unconcerned manner, while at the same time smoke is issuing from the muzzle of the weapon. We say nothing of the crowd of spectators standing around within a foot or two of the cannon, although at the time the picture was put before the eyes of the public it was known that a flaw or crack existed inside the gun, and under these circumstances no one would certainly be permitted to view it at close quarters at the time of its discharge. Indeed, to judge from the accounts in the public press, both artillerymen and visitors have been exceedingly shy of the weapon since its weakness was discovered, and have all gone under cover of late when the signal to fire was given. One of these days, perhaps, we may have an illustrated paper made up of pure photographs only, a publication which, if not, perhaps, quite so interesting as our present journals, will, at any rate, have one element in its favour, that of truth. How much more vivid than all descriptions, or pencil sketches, for instance, would have been a photograph taken by magnesium or electric light of the cavern in which the Rhondda colliers were imprisoned, and of the tunnel cut for their relief, together with pictures of the pitmen in their work-a-day attire! The oft-repeated question, "Is it true?" would never then be asked, for the pictures before our eyes would carry conviction with them. Already, however, photography has done much to keep the artist in the right path, and to prevent him from using his pencil too lavishly, and drawing upon his imagination. We have for some time past ceased to have books of travel published with wonderful illustrations, for, thanks to the travelling photographer, we have become acquainted with a good many natural wonders. The highest waterfall in Europe, that of Gavarni, in the Pyrenees, which used to be drawn as a veritable cataract dashing down from the clouds, and making a clear leap over the rocks of 1,200 feet, becomes another matter altogether when we see a photograph of it. The precipitous wall of rock over which it tumbles may be the height mentioned, but then the water does not fall (or has not fallen since the days of photography) clear of the background, but is broken in more than one place, while the stream is so small that, under ordinary circumstances, it is hardly observable at a distance. These were

facts which the traveller no doubt forgot to tell the artist when the latter drew the picture, and hence the misrepresentation finding its way into print.

THE SWING FRONT VERSUS THE SWING BACK.

BY J. POLLITT.*

THE recent appearance in the columns of the *British Journal* of two or three letters following an editorial article some weeks previously, on the subject of swing fronts and swing backs, seems to favour the supposition that the use of such appendages is, in certain quarters, somewhat imperfectly understood.

When Mr. M. Noton brought his ball-and-socket arrangement before a meeting of the Manchester Photographic Society two or three months ago I ventured to remark that, although the same ends could be equally attained by either swing back or front, or ball-and-socket lens tube, still I had found in practice that the swing back was a much more convenient arrangement, because, for reason No. 1, the axis of the lens thereby always preserves its parallelism with the base line of the camera; and, for reason No. 2, that a much greater latitude is necessary in the sliding up and down of the panel carrying the lens in the case of a swing front than is required when the swing is attached to the back. This is a sufficiently fatal objection when a Kinnear camera is used, because it will be found that the folds of the conical bellows-body will cut off a good deal of the margin of the picture when the lens is raised considerably over the centre.

The dispute about the looking-glass principle is simply a storm in a tea-pot; for it makes not one iota of difference whether the swing be constructed on the looking-glass principle, or whether it be hinged at the bottom in the form of an inverted easel, and in accordance with a very neat arrangement adapted by Mr. J. Rogerson to the cameras made by him many years ago. The right inclination of the plate can be obtained just as easily in one case as the other, and it is simply a question of economy in bulk or convenience in construction as to which of the two methods is chosen. In either case the focussing must be finally and carefully done after the swing is adjusted to the proper angle.

The real use of the swing is, however, a subject of much greater importance than the question of mechanical construction; and, as I consider too little has been said about the former and too much about the latter, I hope it will not be considered gratuitous on my part if I presume to give a short lesson on the subject deduced from my own experience, leaving those interested to use their own discretion as to form and arrangement of apparatus.

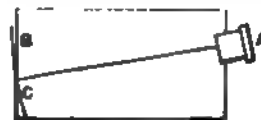
Let it be supposed that the subject to be photographed is the front elevation of a tall, narrow building, say ninety feet high, and that the exigencies of the case require the camera stand to be placed on the ground floor at a distance from the object only of eighty or one hundred feet. Supposing the lens to be about three feet three inches from the ground, it is evident that an imaginary line drawn from the centre of the lens to the summit of the building will be considerably longer than another imaginary line from the centre of the lens to the base of the building; and, therefore, by reason of the focus of the lens being regulated inversely by the distance of the object from the lens, it will be found that the lower part of the focussing screen, on which is depicted the upper portion of the picture, will be required to be brought nearer to the lens than the upper part of the screen on which is depicted the base and foreground. The simplest way of meeting the difficulty is unquestionably by a swing-back arrangement to adjust the screen, so that all parts of the subject are brought into the best focus at one and at the same time. This being done, and the camera absolutely levelled, it

will still be found that the parallelism of the perpendicular lines on the ground glass will not stand the test of a carefully-applied measuring rule. The reason is obvious. By means of the swing we have shortened the focus for the upper part of the object, and, in consequence, reduced the scale of the picture, and the distance between perpendicular lines as compared with the lower portion so much nearer to the lens; so that, after all possible care with spirit level and swing, it will be seen that there is still a falling inward of perpendicular lines approaching the summit of the building, which, however, can be counteracted by a slightly downward tilt of the camera bodily. This slight movement should be sufficient to cause the upper lines to diverge to just the extent only to which their greater distance from the lens would make them converge, supposing the camera to be perfectly level.

To the photographer who is thoroughly initiated in all the difficulties of architectural work much that I have said will doubtless seem commonplace and self-evident enough; but I was somewhat surprised that one of the writers above referred to should recommend, as a means of preventing distortion in architectural views, "that the camera must first of all be placed perfectly level, the greatest care being taken that it be not tilted. Next, the lens must be turned or tilted upwards, in the case of a swing front, in the direction of the upper part of the building, assuming it to be a lofty one," &c.

Now these instructions are so at variance with what the case demands, that I am inclined to think the writer in question has either penned them in a moment of forgetfulness, or otherwise has not weighed the subject well over in his mind beforehand; for it is evident that in the turning of the lens upwards, by either a swing front or ball-and-socket lens tube, the result will be exactly tantamount to swinging the back forward—that is to say, it will bring that part of the focussing screen on which the longer pencils of the basement and foreground fall nearer to the lens, and that part of the screen receiving the shorter pencils of the upper portion will be thrown farther off, so that by this method it will be impossible to get either freedom from distortion or universal sharpness over the field of view.

Camera Body.



A Lens turned upwards. B Basement and foreground. C Summit of building.

The accompanying sketch will show that, by turning up the lens, the image—say, of the finial of a tall spire—will be formed considerably short of the focussing screen at the lower part, and the image of the foreground will only be sharply defined at a distance outside the screen on the upper portion.

ANOTHER IMPROVEMENT IN MAKING OXYGEN.

BY DAVID YOUNG.*

AT our last meeting Mr. M. Noton gave us to understand that chlorate of potash and black oxide of manganese could not be used conveniently with the portable apparatus until it had passed through the process of being kneaded into cakes or plugs, and then baked. This, I believe, is quite true of every portable oxygen generator with the exception of the one before you; and, as I was the first to show that only one generator was required to be used with the portable oxygen apparatus if it was of the proper construction, I think I am also the first to point out that the oxygen mixture can be used with the portable apparatus without its having to pass through the kneading process.

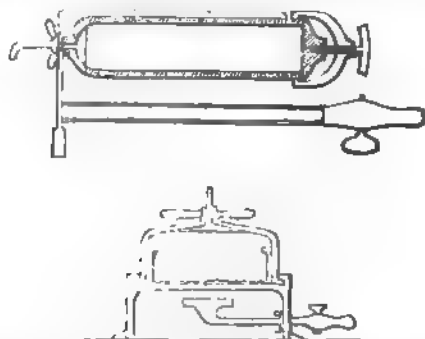
I will now show you my method of making oxygen

* Read before the Manchester Photographic Society.

without having to pass through that dirtiest of dirty jobs, making the oxygen mixture into cakes or plugs; and I would take this opportunity to direct your attention to the very great simplicity of the whole. You may keep the oxygen mixture in a bottle or any thing you wish, and you have simply to pour some into the case, and put the case into the generator. When it is exhausted, you will see how easy it is to withdraw, or perhaps make it withdraw itself.

A few of the advantages I claim for my patent apparatus are follow:—First, the great simplicity and portability of the apparatus. The one before you will generate eight of ten cubic feet of oxygen per hour, and can be carried in the pocket. This, I think you will admit, is a great improvement. Second, greater safety, as the oxygen mixture is placed in an inner case, and, therefore, cannot fly off in pieces, and stop the outlet. Third, the inside of this generator is kept cleaner than any other, because the oxygen mixture is not in contact with it. Fourth, you may avoid the mess of making the oxygen mixture into cakes or plugs, and having to bake them, and afterwards carry them as carefully as if they were eggs, for fear of breaking them. Fifth, you have the exhausted charges in a cleaner and more compact form than by any other plan.

The generator, by altering the shape of the cap, can be used vertically like the old-fashioned retort, in which case to get it to decompose an equal amount of oxygen mixture it would require to be made shorter and larger in diameter. This, of course, increases the circumference of the joint, which is a serious objection; or it may be used diagonally or horizontally, as you see it. Both these positions, I think, were first introduced by Mr. Noton, and either is better than the vertical position for other reasons



besides the one stated. For the benefit of the members not present I have made a sketch of the generator in the horizontal as well as the vertical position, which will, I think, enable them to understand the whole.

CAN PHOTOGRAPHY MAKE PICTURES?

BY PROFESSOR GREENE.*

CAN artistic photography, or, in other words, photography, be classed among the fine arts?

I am well aware that many artists, as well as some photographers, claim that it is not and cannot be so classed. I for one do not belong to that number, though I do not wish to be understood to say that every photographer is an artist, for many of them are nothing more than mechanics, and some of them very poor ones at that. But, you will say, fine art is produced only by the hand of man, and not by a machine. I will agree with you there, if you will only add the head and heart. It requires mind and soul to create fine art; if it did not, every one would or could be an artist, for there is no one so dull but he could

daub paint upon a canvas, and, I think, much easier than make a photograph. The photographer uses the camera, a machine, to make his picture; so does the painter a brush—perhaps a more simple machine. You will say the brush is guided by the hand; so also is the camera.

The camera never tells a lie: the brush frequently does. If the operator is an artist, he will give the subject an easy, natural pose, the draperies will be nicely arranged, and accessories added as required; the light will be so adjusted as to give the exact distribution of illumination and shadow, and the camera will do the rest. With him the result is as certain as with the painter; there is no chance work about it. How is it with the machine photographer? It is all chance; he is continually groping in the dark; he never knows whether his picture will be good or not until it comes out of the camera; and then he is not sure, for he is not a judge of a work of art when he sees it. He may occasionally make a good picture, but he cannot tell you how he did it; with him it is all guess work. On the contrary, the artist sees his picture before exposing the plate in the camera; he is as certain of the result before the plate is developed as afterwards. You say the photographer is only a copyist; he can only make that which is before him, or, in other words, he only copies nature, and that, you say, is not fine art. Let us read a little from Ruskin's choice selections, pages 195 to 198.

“Historical Painting.”—What do you at present mean by historical painting? Now-a-days it means the endeavouring, by the power of imagination, to portray some historical event of past days; but in the middle ages it meant representing the acts of their own days, and that is the only historical painting worth a straw. Of all the waste of time and sense which modernism has invented—and they are many—none are so ridiculous as this endeavour to represent past history. What do you suppose our descendants will care for our imaginings of the events of former days? Suppose the Greeks, instead of representing their own warriors as they fought at Marathon, had left us nothing but their imaginings of Egyptian battles; and suppose the Italians, in like manner, instead of portraits of Can Grande and Dante, or of Leo the Tenth and Raphael, had left us nothing but imaginary portraits of Pericles and Miltiades? What fools we should have thought them! How bitterly we should have been provoked with their folly! And that is precisely what our descendants will feel toward us, so far as our grand historical and classical schools are concerned. What do we care, they will say, what those nineteenth century people fancied about Greek and Roman history? If they had left us a few plain and rational sculptures and pictures of their own battles and their own men in their everyday dress, we should have thanked them. Well, but you will say, we have left them portraits of our great men, and paintings of our great battles. Yes, you have indeed, and that is the only historical painting that you either have or can have. But you don't call that historical painting. You don't thank the men who do it; you look down upon them, and dissuade them from it, and tell them they don't belong to the grand schools. And yet they are the only truly historical painters, and the only men who will produce any effect on their own generation or on any other. And the wonderful thing is, that of all these men whom you now have come to call the great masters, there was not one who confessedly did not paint his own present world, plainly and truly. Homer sang of what he saw; Phidias carved what he saw; Raphael painted the men of his own time in their own caps and mantles; and every man who has arisen to eminence in modern times has done so altogether by his working in their way, and doing the things he saw. How did Reynolds rise? Not by painting Greek women, but by painting the glorious little living Lady Thia, and Lady Thia, of his own time.

“Pre-Raphaelitism.”—Pre-Raphaelitism has but one principle, that of absolute, uncompromising truth in all

* Read before the Chicago Photographic Association.

that it does, obtained by working everything, down to the most minute detail, from nature and from nature only. Every pre-Raphaelite landscape background is painted, to the last touch, in the open air from the thing itself. Every pre-Raphaelite figure, however studied in expression, is a true portrait of some living person. Every minute accessory is painted in the same manner."

It is not my intention to discuss at very great length the subject whether photography is a fine art or not. However, I think we are entitled to the credit of being historical artists, as we furnish and will hand down to posterity more portraits of men and women "in their every day dress" than all other artists put together. But what I wish to call your attention to is some of the errors in the practice of photography, and what I consider our stumbling-block. One of them is the number of accessories that are put in to fill up the picture. They remind one of a second-hand store or a pawnbroker's shop; and the worst of it is that the authors of some of these photographs claim to be A No. 1, and the leading photographers in this country. Had they been educated in art, they would never have committed such errors. Another, which is more fatal to our claim as artists, is the attempt to make a combination picture by printing ~~from different negatives, figures, &c., on one sheet of paper to form one picture, by the aid of an artist working in the foreground, background, &c.~~ To illustrate this error I will refer to one or two pictures that have been made in this city lately. The first one alluded to is supposed to be a regiment of soldiers, not on drill, or in the fierce struggle of battle, but at rest. To me, however, it is not at rest; for I think it almost impossible to photograph a young volunteer at rest; he will be stiff and awkward, do what you will with him. This is enough to destroy all the art or interest in the picture; but we might excuse this fault if there were not others so gross as to defy all the rules of art, and to utterly destroy all the value there is in the picture as a work of art. Each figure in it—say five hundred, more or less, as may be—has a point of sight of its own. Who ever heard of an artist painting a picture with five hundred distinct points of sight? Every one knows, who knows anything of art, that there is not and should not be but one point of sight in a picture. The lighting of the figures, also, is as bad as the posing and drawing, striking some from one and others from an opposite direction; in fact, there are all kinds of cross lights, hardly any two of them agreeing. There are other errors equally as bad; but it is useless to criticise such pictures, for every one can see at a glance that it is impossible to make them in this way and conform to the rules of art. It makes no difference how well the artist has drawn in his portion of the work, the camera has placed a point of sight back of each figure, that he cannot work out.

I do not wonder at an unwillingness to admit us to the position of artists so long as we manufacture such pictures and claim them to be artistic. What photographers ought to do is to classify their work, and have a certain standard by which to admit it as artistic, the same as with the painters; then we might have some claim to the name of artists.

The other picture I will refer to is our Fire Department at work. It has the same faults, so far as art is concerned, as the other, which makes it unnecessary to say anything about it in this respect. As a piece of merchandise it has two features to recommend it which the other did not have: first, it shows action, while the other does not; but the most valuable feature to any one whose portrait is not included in the picture is the artist's work, which renders it a memorial picture of the great fire of October 8th and 9th, 1871.

Pictures of this class would be all right if placed where they belong, as articles of merchandise, but not as works of art.

PHOTOGRAPHIC FASHIONS IN NEW YORK.

MR. FRITZGIBBON, in the *Practical Photographer*, gives, as he promised, some hints as to the fashions prevailing in the best photographic establishments. Here are hints from New York:—

"Of so great importance have become the backgrounds used in photographic portraiture, that we have selected them as the subject for this month's consideration.

"Winter, 'lingering in the lap of May,' is illustrated at Sarony's, where a dreary waste of snow, covering hill, dale, and river, is depicted on one of the backgrounds, still to be seen under his easterly skylight. This has done good service during the closing winter months. With it, children sliding down a hill, young gentlemen skating, and many other scenes incident to wintry weather, have been successfully represented. At this gallery of art, interior backgrounds for full length figures are mostly of the renaissance school, executed with great dash and vigour. There is, however, an indication that the Eastlake or modern Gothic will be used to some considerable extent after May 1st, at the new gallery on Union Square. A handsome conservatory is frequently used for daintily dressed young ladies. The head and bust backgrounds are a very light one, with shadings similar to the standard Rembrandt, and rich shaped woollen one for three-quarter length and standing figures. For children, under the special quick skylight, is used an interior with a plain wall, an open door on the left, and a cabinet of bric-a-brac on the right, all somewhat in miniature. The highest form of theatrical portraiture still forms a part of the business of this gallery. Backgrounds are painted for this branch from sketches which have been made in the theatre during the progress of the play, set pieces, arranged as on the stage, being frequently used.

"Rockwood uses a tapestry interior, in conjunction with an antique cabinet, for imperials; and for groups, a background representing a room with massive marble columns. The centre of this ground, being quite plain, is used for three-quarter lengths, sitting and standing.

"At the new gallery of Fredericks and O'Neil, Broadway, corner of Ninth Street, a seashore, in connection with artificial rocks, is used almost exclusively for children, many beautiful results attesting their value. A garden, with dense foliage, is used for adult standing figures.

"Pearsall (Frank E.), of Brooklyn, has hit upon an entirely new idea. For three-quarter length standing figures he uses a background about five feet in width by seven in height, arranged to slide up and down in a frame, the centre of which is a charming bit of sky, sea and shore, painted within a space of from three to four feet in diameter, the edges being lost or vignetted into the rather light neutral tint covering the balance of the canvas. This background is used principally in his non-distorted prints, also an invention of his, and, we understand, protected by letters patent. His pictures are pearly, have an air of elegance, and are strong and rich when the subject has worn dark drapery.

"At 707 Broadway (Mora's) we find an unusual number of backgrounds in use, the custom being to introduce from one to two or more new ones monthly. They are stretched on frames, one on each side. These frames have no permanent feet, and are hung, when not in use, side by side to hooks in the ceiling near the south wall of the operating room. About twenty backgrounds are thus arranged, and a moment or two suffices to take one down, attach portable feet, and place in position. A great variety of exterior and interior scenes affords an opportunity for the artist to select a background in accordance with the style of dress and social standing of the subject. A new feature at this establishment is a series of eight backgrounds, each five feet by six feet, for the various positions of light and shade desirable in head and bust pictures. Out-door and in-door accessories, real and imitation, are highly esteemed by the proprietor.

"At the Kurtz gallery, for head and bust pictures, the concave papier mache background (the well known invention of Mr. Kurtz), painted a canary yellow, is used. An elaborate interior exhibited at the Centennial by Seavey is one of the latest acquisitions. From twelve to fifteen backgrounds, each designed for a special use and place, are in daily use, rustic accessories and fine cabinet furniture playing important parts. So far as we can learn, the painted backgrounds in use in the above galleries are from the studio of Mr. L. W. Seavey."

HUSNIK'S IMPROVED LICHTDRUCK.*

Thick patent plate glass must be employed, or thinner glass netting on a thick plate. These must be very carefully ground with emery, the grain left upon the glass having some effect upon the print. After being perfectly ground, it is well to treat the plates with an ammonia or alkaline solution.

The first preparation applied to the plate consists of:—

Fresh white of egg	...	...	7 parts
Silicate of soda or potash solution	...	3	"
Distilled water	...	...	8 to 10 "

The silicate solution is of the consistence of oil as it is to be met with in commerce. In hot weather more distilled water is required than in the winter months; the white of egg must be free from yolk.

After standing four to six hours, the clear part is poured off and carefully filtered twice.

The plate in a dry condition is freed from dust with a brush, and placed in a horizontal position. Some of the above mixture is applied to the margin farthest from the operator, and then spread over the surface by gradually tilting the plate and employing a strip of paper, taking care that the liquid does not run too fast. By liberally breathing upon the glass the operation is greatly facilitated. A rapid pouring off of the liquid at one of the corners prevents the formation of air-bubbles, which may also be overcome by a second rapid application of the mixture. The plate is ready next day, when it is dry, or may be preserved some time.

Before the gelatine solution is applied, the plate is washed under a stream of water, and finally rinsed with pure water, which removes most of the albumen and alkali; unless this is done the plate will have no stability. Six parts of fine gelatine are put into four parts of water, and the vessel containing it put upon a water-bath and finally brought to boil. Then one part of bichromate of ammonia is added, and the liquid brought up to its original volume by the addition of spirits of wine. Bubbles which are formed on the addition of the spirit disappear when the liquid is stirred, and the latter should further be filtered. It is kept in a warm condition for application to the glass plates. The latter are dried in a drying cupboard, dusted with a brush, and are then coated with the gelatine solution as if it were collodion. The gelatine runs smoothly over the plate, without the formation of bubbles, and is poured off at one corner without difficulty. The plate is then put into the drying cupboard, standing at an angle of 10°, and when dry a second coating is applied. In returning to the drying cupboard the plate should be reversed, and what was top in the first instance should be bottom in the second. The gelatine solution, by reason of the spirit it contains, dries very rapidly. Afterwards the plate is put by in a dark place; it may be printed at once, or will keep in good condition for a week in summer and longer still in winter. The drying cupboard should be maintained at about 45° Reaumur.

The dry plate is exposed under a negative for a quarter of an hour in the sun, or an hour to diffused daylight. If microscopic sharpness is desired, diffused daylight is preferable, and gives deeper shadows and better half tones. If a proper Lichtdruck printing frame is not at hand, an ordinary frame may be employed, the plate being covered

with a black cloth to prevent any reflection of the rays through the glass. The exposure is regulated by means of a photometer, unless the printer has experience in the matter. If the impression is to be printed with a margin, a mask of proper size is put over the frame during the operation of printing.

The plate is now put into water to soak, so that the unchanged bichromate may be removed; it is permitted to remain immersed for some time, the water being frequently replaced. A remarkable change now comes over the surface of the plate, for there appears a very fine grain, which is sometimes imperceptible, except with the aid of a magnifier. The grain extends over the whole surface of the plate, but it is more frequent and vigorous in the shadows, and lighter and less frequent in the high lights. An examination of the high lights will show whether the bichromate salt has all been washed out, and when this is the case the plate is allowed to dry. Afterwards it is put into water again for three or four minutes, and then placed upon an even lithographic stone, or, better still, upon a well-ground glass plate, resting upon an even basis. The wet plate attaches itself firmly to its bed, and may forthwith be printed from. If preferred, it may be put into an ordinary plaster of Paris bed, like a lithographic stone.

If the plate has been dried too slowly (the cupboard not being warm enough, or without being placed in a cupboard at all) the surface will possess little grain, or even none at all. Plates of this description are very troublesome to print, and soon give flat monotonous pictures. Grain is absolutely necessary, and a good plate, when the roller is passed over it, will emit a peculiar sound due to the roller tearing away from an infinite number of little points. When no grain is present, the roller passes over the surface without any noise.

A good plate is, therefore, to be recognized on inking, and takes the ink rapidly and well. Too coarse a grain is, however, to be avoided, and only arises when the gelatine film is too thick; impressions taken from such a surface do not appear so perfect as in the case of a fine grain. The print should appear very similar to a silver photograph in respect to fineness and delicacy, and the grain should be apparent with a magnifier.

Plates with coarse grain are sometimes desirable, as impressions from them can be transferred to zinc or stone, and etched upon these materials. After the plate has been inked, it is rubbed no more with a wet rag, but another roller is employed, or felt, or filter paper, to apply a mixture of water or glycerine. This mixture keeps the plate moist for a longer time, especially in summer, and renders it at the same time more elastic and durable. If the plate is very wet a second and drier roller may be applied. An under-exposed plate yields light prints, while, on the other hand, an over-exposed plate produces them too dark, and with no pure lights. These defects may be remedied to a certain extent; in the former case a softer ink should be employed, and the operation of inking up conducted very slowly. In the other case a firmer ink is used, and the operation gone through very rapidly. By using two inks, one after another, the first thick and the second thin, vigorous prints with delicate gradations are to be secured. The thick ink, when applied, attaches itself thoroughly to the shadows, while scarcely adhering at all to the lights, and a second roller applied with thinner ink develops the half-tones and detail in the high lights. In this case no time should be lost in inking, but the rollers must be applied one after another as soon as the plate has been moistened. A rapid inking gives much purer whites and better half tones; on the other hand, if the operator is slow, the water partially evaporates or is taken up by the rollers, and the result is a flat and dirty impression. As a matter of course the printer should be a skilful man, so as to be capable of employing one expedient or another in manipulation to improve his prints.

(To be continued.)

* From *Gesammitgebiet des Lichtdrucks*.

The Photographic News.

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ON THE FACT IN PORTRAITURE FROM UNEQUAL EXPANSION OF PAPER.

Distortion in photographic images from the use of defective lenses, or the misuse of good lenses, is a defect with which most photographers are familiar; imperfect use of lenses of short focus being one of the most common forms of the latter fault. There is, however, another source of inaccuracy, but little noticed or recognized, which is probably by far the most frequent in occurrence: we refer to the inaccuracy in proportions of the image arising from the unequal expansion and contraction of some samples of paper, arising from the ordinary and necessary operations of wetting and drying. All samples of paper, as is well known, expand when wet, and contract when dry; and if the shrinkage on drying were precisely in the same ratio as the stretching when wet, all would be well. But, unfortunately, this is not so. The contraction on drying is probably much the same in amount as the expansion on wetting the sheet; but it is not necessarily in the same direction. Released from a certain tension to which it was subject in the original manufacture, the paper frequently shrinks more in one direction than another, and hence a portrait subject to these conditions may be thinner or stouter in the print than in the negative.

We have before called attention to this fact, and entered in detail into the character of the defective results arising from it; but the subject is still, we fear, not sufficiently well understood, or sufficiently carefully considered, by photographers. We have recently received, from an experienced portraitist, four prints—two pairs—asking us to examine and note the difference in prints from the same two negatives, and printed on paper from the same batch, which, nevertheless, are very appreciably different in the proportions of each face, one of each pair being about the sixteenth of an inch longer than the other. The cause is very apparent. It is clearly due to the unequal shrinkage of the paper to which we have just referred. If each print had been printed on a piece of paper cut from the sheets in precisely the same direction as the other, each might have presented inaccuracy of proportions in relation to the negative; but the defect in each, being similar, would not have excited attention—the obvious variation in the prints being the point which strikes the observer. This is a defect which is, we fear, beyond remedy, except so far as it may be possible and desirable to examine samples of paper at the outset, and reject those in which the defect is most strongly marked. It may, in some cases, however, be made useful, where a little flattery is desirable, in giving delicacy to a broad face, or *vice versa*. Some observations on the subject by an intelligent American photographer, Mr. Carl Myer, appeared sometime

ago in our Philadelphia contemporary, which it may be interesting to reproduce here. Mr. Myer says:—

"If the printer will take a slip of sensitized paper cut from the long way of the sheet, and another cut from the short way or at right angles to the first, and print from each, using the same negatives and an oval mask, then tone, fix, mount, and finish, he will be in a position to fully comprehend the really dangerous possibility of this source of distortion. The negatives will not agree with either of the prints, while they will not agree with each other. One oval will perhaps be of the same height as the mask which formed it, but from $\frac{1}{32}$ nd to $\frac{1}{16}$ th of an inch wider. The other print will perhaps be of the right width, but considerably longer or higher. The first print will exhibit a round, fat face, while the other will be longer or more 'peaked,' neither agreeing with the just proportions of the negative. In the enclosed samples, 'Latitude' and 'Longitude,' the distortion is apparently increased by printing the broader portrait through a square or arch-top mask, while the other is printed oval; but the dividers, or measuring tools used to compare them, will detect decided distortion. In the long picture the eyes appear 'rounder,' the nose longer, and the mouth narrower, and fuller tipped. The broad picture is positively pugnacious, the phrenological organ of combativeness being apparently well developed, the nose being 'puggy,' and the mouth wide. In a profile portrait this distortion is somewhat less perceptible; still the addition of (say) the hundredth part of an inch to a man's nose is not to be sneered at.

"If an exact square is cut from a sheet of paper whose sides are diagonal to those of the square, this bit of paper will be found diamond-shaped when finished, and a print on it will be diagonally distorted.

"While we contented ourselves with the carte-de-visite, or the small head vignette, these distortions were not conspicuous; but in these later days of 'swellheads' it is so evident that I have yet to see the batch of prints made on paper more or less 'cross-grained' among which I cannot detect this difference as rapidly as I can count the finished prints.

"It is evident that the different prints cannot all be correct, while comparison with the negative by measuring tools will prove that none are correct, and this source of error having been admitted as more or less constant, it remains to be decided what shall be done with it. I have made considerable use of it in making fleshy people look thinner, and *vice versa*; and I am particular to print my pictures from certain negatives all the same way of the paper, so that the subject will have no means of comparison.

"My experiments teach me that this distortion exists in greater degree among the later brands and the so-called double albumen papers, while among both these and the thinner papers I find various degrees of difference. The distortion is also much more apparent in prints that are trimmed before printing, and mounted soon after washing or before shrinking by drying thoroughly. It is also more apparent in front views of the face. Long silvering is also an exaggerating cause, for the then very wet paper shrinks considerably in drying and before printing, and expands in washing. I recommend this matter to the consideration of photographers as a more fruitful field for possible distortion than any other ever opened to the fraternity, and as possessing some compensating advantages if judiciously handled."

THE IDENTIFICATION OF WAR CORRESPONDENTS.

It is nothing new to employ the photographic portrait as a means of identification. It was so used, it may be remembered, at the Paris Exhibition of 1867, when every season ticket holder was required to paste upon the back of his admission card a picture of himself, together with his signature underneath. In this way the check-taker at the doors had some evidence that the ticket was in the posses-

sion of its rightful owner when presented as a passport for admission. Since then the same means of permitting identification has been used; but after all it is a plan that has been rarely resorted to, notwithstanding the advantages which the method certainly possesses.

Recently, however, the method has again been resorted to, and in a more important connection than hitherto. The Russian Government had set its face against permitting war correspondents to join their army; but now, it appears, owing to the strong representations made by General Ignatieff, the War Minister has at last consented to the presence of journalists in the Muscovite camps. That the permission shall not be abused, and that only recognised correspondents shall enjoy the privilege, the Russian Government has ordered that every journalist with the armies shall wear a numbered medal, which will be delivered to him, together with an inscription showing his name, function, &c. This medal will serve him as a passport everywhere, and "it carries on its reverse a photograph of the wearer, in order to put the question of identity beyond dispute."

This regulation is, undoubtedly, a very wise one, for a photograph will do more to identify a man than all the descriptions that could be written. Moreover, a photograph is a thing easily referred to, and those whose duty it is to examine suspicious strangers, and to discover whether they are friends or foes, will be able to arrive at a conclusion more quickly. Again, the photograph has much to recommend it, from the circumstance that there must be great numbers of men in an army not only ignorant of the Russian and French languages, but unable to read at all. A photograph in this case at once infuses confidence, and prevents the poor journalist being taken into custody, and, perhaps, kept prisoner for days, before a superior officer can be found to decide in the matter. The duties of a special correspondent are, at times, exceedingly likely to lead him to be considered a spy, and thus place him in a position of danger, so that the wearing of a distinctive medal with his own photograph on the reverse, to prove his identity, will frequently stand him in good stead. The application of photography in this case, as a means of identification, is, indeed, one of the happiest that has come under our notice.

FRENCH CORRESPONDENCE.

A TOTAL ECLIPSE OF FOUR DAYS—THE TRUTH OF ASTRONOMICAL PHOTOGRAPHS IMPUGNED—GLASSWOOL FOR FILTERING SILVER BATHS—M. CHARDON'S PROCESS—DETAILS OF M. BOIVIN'S DRY EMULSION PROCESS.

IF we are to believe a communication made, in all seriousness, to the Academy of Sciences on Monday last, by a gentleman whose name unfortunately escaped me, photographers have in prospect several days of enforced holiday, since *la matiere premiere*, as Niepce used to call light, will fail them altogether during that period. It is a question of nothing less than a total eclipse of the sun, which will last for *four consecutive days*, during which the earth will be plunged in total darkness. The author of the communication which contains this revelation (set forth in not less than four pages) bases his statement upon the most certain calculations to guarantee the fact. Here, at any rate, will be a very good opportunity for a trial of Mr. Vanderweyde's system of lighting by means of electricity.

At the same meeting of the members of the Academy, which was rendered particularly mirthful by the strange communication in question, a matter transpired which called attention once more to the value of photography in connection with astronomical observations. I spoke in my last letter of the circumstance of M. Janssen having made a presentation of two pictures of the sun, taken at the Meudon Observatory, which pictures demonstrated the sudden formation of a spot upon the solar disk. Some

gentleman has taken the worthy astronomer to task in reference to the subject, and complains that the latter is desirous of establishing a new theory in respect to the formation of solar spots, which never show themselves, he avows, in a sudden and abrupt manner. To this attack M. Janssen replied that he put forward no theory at all, and that he has simply confined himself to signalling an indisputable fact, since a picture of the sun taken on the 14th of April did not show any spot, whereas that secured upon the 15th, under the same conditions, betrayed the presence of one. This is certainly an argument which cannot be gainsaid, and which is worth more than all the theories put together.

A chemist of Leipsic, M. Paulcke by name, who is now on a visit to Paris, showed me, the other day, some specimens of a very interesting product which has received the name of glasswool. Its aspect is very similar to spun cotton, or rather silk, for the light and delicate fibres of which the tuft was composed were exceedingly brilliant, and of dazzling whiteness. This glasswool is very soft to touch, and extremely light. M. Paulcke proposes this product for use by photographers, and especially for the filtration of nitrate of silver baths.

Appropos of the publication of M. Chardon's process, which is based, as the author acknowledges, upon the employment of a dry emulsion, M. Boivin has communicated to me the method he has employed for some time past for preparing an analogous product—that is to say, pure bromide of silver imprisoned in pyroxyline. Dissolved at once, this product, though possessing certain advantages, has, according to M. Boivin, also serious inconveniences, difficulties in manipulation, loss of time, &c. M. Boivin's process may be summarized as follows:—A glass plate is covered with bromized collodion made up of—

Ether	...	...	...	60 cub. cents.
Alcohol	..	...	...	40 to 50 "
Pulverulent pyroxyline	...	...	...	1.50 grammes
Bromide of zinc or ammonium	...	...	...	1.50 "
Bromide of uranium	...	...	...	1.50 "
Chloride of barium	...	...	...	0.10 "
Alcoholic tincture of bromine	...	...	...	A few drops

The two bromides above indicated may be replaced by 2.50 to 3 grammes of double bromide of cadmium and ammonium, suppressing the chloride of barium. In any case, there is first of all dissolved the salts in the alcohol; the solution is filtered, and the cotton is added after being separated in the ether. The whole is shaken, permitted to settle, and then filtered or decanted in the ordinary manner. The plate coated with collodion is plunged in a silver bath of 20 per cent. strength slightly acidified with nitric acid. It is then washed in several waters, and the film passed into a solution of chloride of zinc made up by dissolving one part of the salt in 1,000 parts of water, after which the plate is again energetically rinsed in water. Finally, by the aid of a short brush, the sensitive film is scrubbed off, which consists of pyroxyline and bromide, and collected in a small quantity of distilled water. After having prepared in this way a certain quantity of the substance, it is washed as well as possible, and dried upon filter paper. M. Boivin assures me that these washings suffice to remove all the injurious salts from the film, so that in the end one has but pure bromide of silver remaining, which is encrusted in pyroxyline. It need not be said that the operations which have just been described must all of them be conducted in the dark, or in a locality illuminated only by yellow light. When it is desired to prepare an emulsion, three grammes of this product are redissolved in—

Ether	...	...	...	50 cub. cents.
Alcohol	...	...	...	45 to 50 "
Morphine, cinchonine, or quinine	...	...	...	0.25 "

After some hours the dissolution of the dry product will be completed, and the emulsion is then filtered through cotton wool. It preserves its sensitiveness unimpaired for a long

time. To prepare dry plates, the glass surface is covered with this sensitive collodion, and the film allowed to dry; but if the collodion is to be used wet, the coated plate is dipped into water for some seconds before being placed in the dark slide, an operation which has the effect of increasing the sensitiveness of the film. Plates prepared with this emulsion may also be covered with an organic preservative. Before proceeding to the development of the film, some ordinary spirits of wine is poured upon the film, which has the effect of dissolving the salts of morphine, cinchonine, or quinine, and to open the pores of the collodion, taking away its property of contraction. A washing in water succeeds, and then the operation of development begins with the aid of an alkaline developer. Although the whole of these operations appear at first sight a little complicated, the employment of dry emulsion avoids the application of preservatives and a series of laborious washings. In fact, the method just described, notwithstanding its apparently elaborate character, is an exceedingly simple one, for the manipulations involved are in no way complicated or tedious to undertake. And for this reason it is an emulsion process which well merits the attention of practical photographers. ERNEST LACAN.

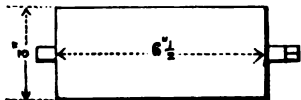
A CHEAP AND EFFECTUAL BURNISHER.

BY NELSON K. CHERRILL.

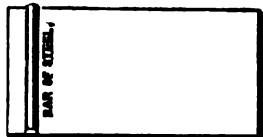
I HAVE just completed a burnishing-press or roller which has cost me about a pound, and as it works as well as or better than one of an American make which was offered me by a dealer for six pounds ten shillings, a description of it may be of some use to your readers.

I will premise that any one can make a press such as I am about to describe if they will only go about it in the manner pointed out to them. My procedure, then, was as follows:—

I procured, in the first place, a roller—this is made of iron, and turned up true in the lathe. The dimensions are (as shown in the sketch) six and a-half inches long and three inches in diameter. Turned upon each end of



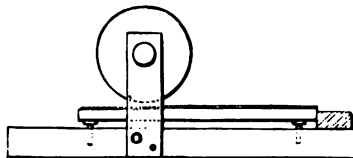
the roller there is a pin half an inch in diameter, and beyond one of them is a square to fit on a handle. The plate is a piece of iron three-quarter inch thick and eight inches long, by six and three-eighths wide. About two inches from one end there is a bar of steel a quarter inch square, brazed on right across the plate thus.



This bar is filed this shape at the top and well burnished all along the upper surface. This burnishing of the steel bar may seem a difficulty to some of the brethren of the camera who are not given to mechanical pursuits. It is in reality very easy of accomplishment. The bar of steel having being filed to its proper shape—care being, of course, taken that the top edge is true, and straight in the direction of the length—needs only to be well rubbed down with fine emery cloth and oil, and then rubbed hard for a few minutes with a rounded piece of bright steel, as, for instance, the back of a gouge; in a few minutes this will produce an admirable burnish, well suited to the requirements of the case.

To mount and complete the press I procured a piece of wood eighteen inches long, two and a-half inches thick,

and seven inches wide (the length being to secure greater steadiness). In the centre on each side there is an upright raised. Being let in, and screwed into the base, near the top of these there are two holes, in which fit with some accuracy the ends of the roller, the one with a square



projecting far enough through to admit of the handle being fastened on. (The handle is not shown in the sketch). When in its place, the bottom of the roller should be about two inches from the top of the base board. The plate is supported underneath the roller by means of three three-inch screws, which are shifted up and down by means of a screw-driver, till the plate being put in position, there is an equal slit or opening between the roller and the burnished steel bar of about the thickness of a mounting card. A stop of wood screwed on to the base-board prevents the plate slipping out of position when the press is used.

To use the press, I take out the iron plate, and place it over a Bunsen gas-burner till hot enough; when heated I carefully wipe the burnisher before replacing it in the machine. I find that one heating will enable me to burnish about three dozen cartes; after this, if the highest polish be desired, the plate must be re-heated: a very little practice will serve to show how hot the plate must be made. The advantage gained by having the plate so thick and large is, that being once heated it retains the heat for long enough to enable a considerable number of prints to be rolled. In those presses in which a lamp is placed underneath the plate as it stands in the machine, I have noticed a difficulty caused by the water of combustion condensing on the roller-plate, &c., and thereby causing rust, if not carefully wiped up each time the press is used. If on the first trial the roller refuses to draw the card over the surface of the burnisher, it will be necessary to take a rough file and scratch the surface of the roller in all directions; this will render the "bite" quite satisfactory; but it will probably be unnecessary to do this unless the roller has been turned to a very fine surface. The essentials of this press are the true turning of the roller, and the straight, well-burnished edge over which to draw the print; the pressure needed in hot burnishing is so much less than in rolling in the old-fashioned way, that the wooden supports and bed are quite strong enough.

After my press had been in use a few days, I found the cards much scratched; on attempting to burnish them, I found then that a little piece of oilstone rubbed over the surface of the burnisher gave an excellent surface which, though not a true burnish, is yet so smooth that the carte takes a perfect gloss on being rolled over it.

In finishing prints with the burnishing press, it is best to retouch after the burnish is given, as the machine has some tendency to rub off the brush work.

SAFETY OXYGEN GENERATOR.

BY W. J. CHADWICK.

SINCE I introduced to the meeting of the Manchester Photographic Society, two months ago, my oxygen generator, I have thought proper to modify its construction, making it into a safety apparatus, by the use of which explosions or accidents are next to impossible. The retort or generator is in form very similar to that first introduced, but the difference is in the mode of fastening. From the accompanying drawings (figs. 1 and 2) it will be seen that the retort is formed of two pieces; a flat plate, A, and a cap, B, which has an aperture at the top, into which is

screwed the pipe for carrying away the gas. In other respects they are two simple castings, ground to a gas-tight

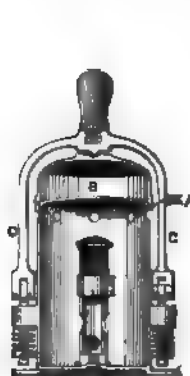


Fig. 1.

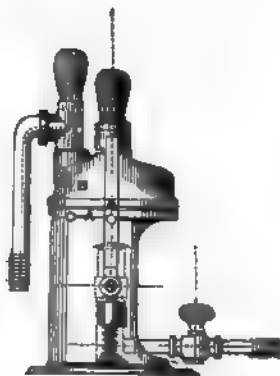


Fig. 2.

fit (a very simple matter), and if ever required can be renewed at a cost of about half a crown. The cap B is weighted by two spiral springs at the extremities of the bow, C, to about seven pounds dead weight, which, on a three-inch diameter retort, is equal to one pound pressure per square inch, or twenty-seven and a-quarter inches water pressure, and as it is not usual to use more than from five to six inches of water pressure (or less than a quarter-pound per square inch) in a gas-holder for oxyhydrogen lime light, I consider the one pound sufficient margin for excess.

Now it is obvious that if the passage from the generator to the gas-holder be stopped up, either by omitting to open the tap, or from any other cause (such *has* been the case, and, in some instances, nearly caused fatal accidents), the pressure in the generator would soon rise, and when it had arrived at the pound pressure would lift the cap and allow the gas to escape, on the same principle exactly as the safety-valve of a steam boiler, but with less force, for one pound pressure out of a three-inch diameter safety valve would be hardly noticeable. Now as soon as the passage is again clear, the gas would take its right course, relieving the pressure inside the retort, and by virtue of the springs the top would assume its original position. This method of weighting the retort by springs forms an excellent mode of attachment.

To open the apparatus, pull over the wooden handle which is fixed on the top of bow C, and the cap B may be lifted off by the handle thereto. For closing the retort, reverse the operation, which is almost instantaneous, and far superior to any method of screwing.

It will be seen that I use an ordinary Bunsen burner; Wallace's, with a perforated cap, I find the best, the heat from which is generated far above the springs which act as weights, and therefore are not likely to get hot and lose their temper.

The chlorate of potash and manganese are mixed and formed into cakes, which, when dry, are quite hard, and not at all fragile, as some people have supposed; they are extremely clean to handle, and the making of them is not the "dirtiest of dirty jobs," for with a basin, a knife, a mould, and a little gum water, they can be made almost without soiling the fingers. Since I first introduced the cakes I find the substratum of manganese not necessary, as if the cakes are dry they do not stick to the apparatus objectionably, being only in contact with the retort bottom, which is made convex, so that the cakes shall not bear all over. By this precaution the spent cakes may be removed from the retort in their entirety, slightly distended, but otherwise in their original form.

As more chlorate of potash can be got into less bulk in the cake form than loose powdered chlorate, it is obvious that more gas can be generated with fewer charges, one cake three inches diameter and one inch thick being equal

to a plug one inch diameter and nine inches long, or about two ordinary plug charges.

I exhibited this apparatus at work before the members of the Manchester Photographic Society; the time from the lighting of the burner until the gas began to generate was one and three-quarter minutes, or about one-third of the time of another apparatus then and there tried.

To illustrate the safety of the apparatus at the above exhibition: as the gas was coming off rapidly, the outlet was closed, and the gas was still generating and escaping through the joint, as intended, with perfect safety.

There are other methods of weighting the retorts, as shown in the two drawings (fig. 3, dead weight; fig. 4, lever

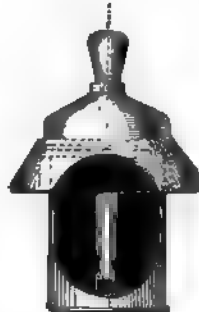


Fig. 3.

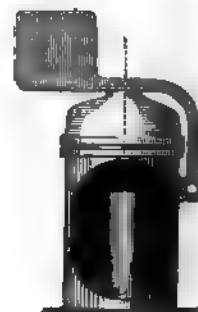


Fig. 4.

and weight). In these cases the weights might be utilised for weighting the gas-holder, but I prefer the apparatus with springs, and to weight the gas-holder with water in a reservoir at the top of the gas-holder placed there for that purpose.

THE PARIS DRY PLATE COMPETITION.

M. CHARDON'S PROCESS.*

THE excess of nitrate of silver passes into chloride of silver; the excess of chloride of cobalt is eliminated by the washings which follow, and the operator approaches as far as possible towards the theoretical production of pure bromide of silver. It is as well to test after an hour or two of contact, in order to see if a sufficient quantity of soluble chloride has been added, and that there remains no excess of free nitrate of silver, for even after repeated washings the excess of nitrate of silver may prevent the preservation of the product.

The mixture thus obtained contains, besides bromide of silver and pyroxyline, nitrates of zinc, cadmium, ammonium, and cobalt, and chloride of cobalt, which it is well to get rid of by precipitation.

The collodion is poured gradually, little at a time, into a large quantity of distilled water; after agitation, the precipitate is collected upon a piece of fine linen in a funnel. You repeat as many times as it is necessary to precipitate all the collodion, and each precipitate, as it is recovered, is added to that in the funnel; washing with abundance of water succeeds, until the water passes off perfectly pure, and then you drain, press, and spread the substance upon stout filter paper, where it is dried in complete obscurity.

The product should be a flocculent matter of a clear yellow colour and very light, and constitutes the dry emulsion. To prepare the plates, there is taken:

Ether	50 cub. cent.
Alcohol	50 "
Cinchonine (or precipitated quinine)	0.20 "

You commence by dissolving the cinchonine in alcohol

* Continued from page 246.

(according to recent experiences, M. Chardon prefers quinine), and after filtering, 3.50 grammes of the dry emulsion are put into a mixture of the two liquids. This quantity is only nominal, and varies according to the viscid nature of the sensitive collodion that results; the mixture is vigorously shaken several times, and, after some hours, filtered through cotton wool, when it is ready for use.

The plates, having been carefully cleaned in the ordinary manner, and treated with talc, may be edged with a solution of rubber in benzole. (In our experiments this precaution did not appear indispensable). They are then covered with the liquid emulsion, the operator manipulating with rather more care than in working with wet collodion, and the films set to dry. Our experiments prove that these plates may be employed wet; their rapidity is then much greater than when dry. The time they will keep has not yet been determined. The film should be opaline and slightly brilliant. Matt and porcelain films rarely give good results.

The time of exposure appears diminished by two-thirds when these plates are compared with ordinary dry plates, such, for instance, as tannin or albumen (Taupenot) films. It is about double that required by a good collodion worked wet. The prints are remarkable for the delicacy and details of their half-tones.

The development is undertaken by the aid of the following solutions:—

- | | | | |
|-------------------------|-----|-----|------------------|
| 1.—Carbonate of ammonia | ... | ... | 20 grammes |
| Bromide of potassium | ... | ... | 0.40 " |
| Water | ... | ... | 1000 cub. cents. |

The carbonate of ammonia which is dissolved should be in a state of sesqui-carbonate—that is to say, in hard and transparent pieces—and should not have passed into the condition of bicarbonate, when it becomes opaque and friable. In this condition it develops only with great difficulty.

- | | | | |
|--------------------|-----|-----|-----------------|
| 2.—Pyrogallie acid | ... | ... | 10 grammes |
| Alcohol | ... | ... | 100 cub. cents. |

The development is commenced by covering the sensitive surface with a film of alcohol, which is poured back into a vessel, and may be employed afterwards for other plates. In this way the cinchonine or quinine is dissolved, and the pores of the collodion film are opened. The surface is rinsed with alcohol carefully until water will run uniformly over the surface. The plate is then put into a bath, and covers red with a mixture, made at the time, of one hundred parts of the ammoniacal solution, and two or three parts of the pyrogallie solution. Under the influence of this mixture the image rapidly appears, and will not fog if the manipulation is well carried out. As soon as all the details have come out, the intensifying mixture is at once added:—

- | | | |
|--------------------------|-----|--------------------|
| 1.—Distilled water | ... | 100 cub. cents. |
| Bromide of potassium | ... | 1 gramme |
| 2.—Bicarbonate of potash | ... | Saturated solution |
| 3.—Distilled water | ... | 75 cub. cents. |
| Alcohol | ... | 25 " " |
| Glucose | ... | 10 grammes. |

The mixture is made by taking equal proportions of the three solutions, about five cubic centimetres of each being required for one hundred cubic centimetres of alkaline developer. The bromide of potassium protects the negative from fog, and must be carefully handled. The glucose adds to the intensity of the image, and may be added in larger quantity, according to necessity.

The image acquires its proper intensity in a few seconds, and it must be borne in mind that the cliché gains in vigour on drying, after it has been fixed. The development must not be pushed too far, therefore. The cliché, as finished, is fixed with hyposulphite of soda, which is done

a very little while, and finally washed and dried. If necessary, it may easily be detached from the glass by means of gelatine.

Such are the formulae and manipulations employed by M. Chardon. The experiments made by us (the reporting committee), under the conditions prescribed by M. Chardon, have given the most conclusive results. Consequently, M. Chardon has complied with the conditions of the competition in making public his whole method of operating.

After conducting several experiments with a view to testing the process, the committee have unanimously come to the conclusion that M. Chardon is entitled to the prize, and recommend, therefore, its award to that gentleman.

SCIENCE AND WAR.

MR. BADEN PRITCHARD, writing in a recent number of *Nature*, calls attention to the part science, and especially the camera, has played in war. He says:—

"Recent wars have had particular interest for the man of science. Starting from the close of the Crimean war, the first in which the electric telegraph was employed, we find ample examples of the assistance furnished to the soldier by scientific research. One instance taken from the war of 1858 is especially interesting. The Austrians held Venice at the time, it may be remembered, and to protect the harbour torpedoes were laid down. The torpedoes were fired by electricity, and contained gun-cotton, this being the first instance on record of the employment of electric torpedoes and of the newly-invented nitro-compounds. Nor was this all. The torpedo system devised at Venice by the Austrian engineers had yet another point of scientific interest. A camera-obscura was built overlooking the harbour, and upon the white table of this instrument were reflected the waters of Venice. As the torpedoes were sunk one by one a sentinel in the camera noted the place of their disappearance with a pencil, giving each torpedo a consecutive number. A row boat in the harbour described a circle around the sunken torpedo indicating the zone of its destructive power, and the sentinel again, with his pencil, made a corresponding ring upon the camera table. In the end, therefore, while the harbour itself was apparently free from all obstruction, a very effective means of torpedo defence was established, the key of which was only to be found in the camera-obscura. The sentinel here had wire in connection with every torpedo, and was in a position to fire any one as soon as he observed—by means of the camera—the presence of a hostile vessel within the limits of any of the circles marked upon his white table.

"In the American war of 1860 the electric torpedo, invented but two years before, played a most conspicuous rôle, and formed, indeed, with the use of big guns and monitor ironclads, one of the most important features of the struggle, at any rate from a scientific point of view.

"The war of 1866, when the Austrians suffered such a terrible defeat at the hands of the Prussians, will long be remembered as a combat between the old muzzle-loading rifle and the breech-loader, in which the latter was victorious.

"The Franco-German struggle of 1870, again, though marked by the employment of no special arm, if we except the mitrailleuse, was assisted by important applications of science: to wit, the reproduction, by means of photo-lithography, of the French ordnance maps and plans, which were distributed in thousands throughout the German army, and the establishment in France of *la poste aerienne* to communicate with the besieged garrison of Paris. From September 23rd to January 28th, when Paris was practically cut off from the rest of the Republic, no less than sixty-four balloons left the city with passengers, mails, and pigeons, and of these only three were lost, while five were captured. The return post by 'homing pigeons'

was hardly so regular; but, nevertheless, half the number of dispatches given in by correspondents at Tours and elsewhere—or, in other words, one hundred-thousand messages—were, by the unflagging energy of the postal authorities, carried into the beleaguered capitol. The present Russo-Turkish war cannot well be less interesting than those that have so recently preceded it; and we may especially point out two directions in which fresh examples of scientific warfare will probably manifest themselves—in connection, namely, with the cavalry pioneer and the Whitehead torpedo. Both of these will probably be seen in warfare for the first time, and before many days are past we may hear of their doings in action. The cavalry pioneer must not be confounded with the Prussian Uhlán who played so conspicuous a part in the last war. The ubiquitous Uhlán, terrible as he was, did not work the injury which some of the Cossacks will have it in their power to inflict if accounted as pioneers. These are selected from the smartest and most daring troopers, lightly armed and well mounted. In a belt round their waists they carry a few pounds of gun-cotton or dynamite, and with this highly destructive explosive they may work incalculable harm. A small charge of gun-cotton, placed simply upon a rail, and fired with a fuse, suffices to blow several feet of the iron to a distance of many yards, thus rendering the railway unserviceable on the instant. A trooper may dismount, place a charge at the base of a telegraph pole, fire it, and be in his saddle again within sixty seconds. Wires may thus be cut and communication stopped in the heart of an enemy's country by fearless riders, who have but to draw rein for an instant to effect the mischief, while lines of railway in the neighbourhood are entirely at their mercy. Even light bridges and well-built stockades may be thrown down by the violent detonation of compressed gun-cotton, and forest roads considerably obstructed by trees thrown across, which are never so rapidly felled as when a small charge of this explosive is fired at their roots. The influence of the Whitehead torpedo, of which we have heard so much of late, will likewise be felt for the first time during the present war. An implement so ingenious in its character that, as Lord Charles Beresford the other day happily remarked, it can do almost anything but talk, is in the possession of both belligerents, and will doubtless be heard of before long on the Danube and in the Black Sea. These torpedoes are manufactured at Fiume on the Mediterranean, and, like Krupp guns, are to be purchased by any one who chooses to pay for them."

HINTS FOR CARBON WORKERS.

BY J. INGLIS.*

LONG, long ago, it appears to me, I promised to make you some negatives for your journal. When I promised to do so, I intended to fulfil the promise; but the fact of the matter is that I have been so troubled with those miserable chromotypes that I have had no time to take negatives for you, nor scarcely customers; fortunately there have been very few of them to trouble me all winter. So I have had a pretty good opportunity to work on the chromotypes, and with what results you will please judge for yourself from the samples I send you per this mail. I see, from your last number, you quote me as calling the process "simple simplicity." Well, it is; but I have been thinking a few times, nevertheless, as I have been trying to master this simple process, that I have been more like "simplicity" than it. However, since I have discovered where all my troubles lay, I will now reiterate the statement, with double force, that it is "simple simplicity." My first great mistake was in deviating from the rules laid down by Mr. Lambert. I am very much given to cut

a road for myself, and though I would not advise any chromotypist to do so at the beginning, I will say that I find a very great benefit from having done so. Of course the road was a hard one to travel, and I was very near backing out, and calling Lambert a humbug, and his process a bigger one. But just before giving up and confessing I was beat, I began to meet with success by degrees, and now, for these few weeks past, I have been getting into the simple, simple way of working it with great ease and pleasure.

To-day I found a gentleman standing looking at a case of chromotypes I have at the door on exhibition. "Mr. Ingles," he said, "I don't like this new style of picture."

"Why, that is strange, as every person seems to like them. Why don't you like them?" I asked him.

"They seem to stick out too much,"—motioning with his hand as if he would have pulled the likeness off the cards.

I think that critic's dislike will speak for itself.

Another case which is worth noticing for the sake of the fraternity who have not seen any chromotypes, but who have heard they are poor pictures, and not fit to be compared with silver prints:

A stock-dealer here, who has not the privilege of selling the Lambert patents, was very loud in his condemnation of the chromotypes—so much so that we had a few angry words over their merits and demerits. You may judge of my surprise on seeing my friend walking into my rooms a few days afterwards, and tendering me his congratulations on my success. In the meantime I had got a few of the pictures on exhibition at the door, and he had been attracted by their superior appearance, and, after examining them, he said he felt it to be his duty to come in and own up like a man that he was wrong in condemning them as he had done, and that he would now take back all he had said about them, as they were really a decided improvement on the silver prints; in fact, they were the best thing he had ever seen. When will our friend, the editor of the P. P., let the scales drop from his eyes? It is a fact that the silver prints are left clean behind, and it makes no matter who writes against the chromotypes: they are the pictures of the future, at least till they are outstripped by something we have not heard of yet.

For the good of carbon workers who may be troubled in any weather with their tissues drying too hard, I would recommend them to put it into a fuming box, and place a flat dish of hot water beneath it for ten or fifteen minutes, when they will find it as pliable as a piece of patent leather. Roll it up and put it in a tin box, when it will keep this way for a long time.

There has been a great deal said about mounting the chromotypes. Now, the best possible way to mount them is with gelatine. I have a tin pan which holds a gallon or so, which I keep always ready. When I want to use it, I heat a few minutes until re-dissolved; put it into a developing tray the size of the plates my pictures are on; soak the cardboards a few minutes, which are to be the same size as the whole of the pictures, on the glass; now, with a small sponge, rub over the back of the pictures a little of the gelatine; then lay on the cardboard, and, with a printer's hand-roller, roll out the surplus gelatine back into the tray, and with another sponge, and under the tap, wash off the gelatine from the back of the card and face of the glass; then squeeze the cardboard tight down, pile them all on top of each other, leave under pressure for an hour or so; then take and bind around the edge with strips of wood and spring clips, set them aside to dry, and when dry they will come off perfect and in full gloss. I prefer rolling them afterwards on a cold plate; not through a burnisher, but on a flat bedded roller. It gives them a very fine gloss, with a nice grainy appearance, and takes away a little hardness which glass pictures generally have, especially as I see them. I now cut them out upon a piece of lead, with dies round-

* St. Louis Practical Photographer.

cornered, the size of cartes and cabinets. With these same kind of dies I make my masks and tinters, at a cost of about five cents, instead of the Lambert frames at \$3.25 each, making a masker and tinter \$4.50, while mine is a great deal better every way for ten cents.

Instead of using the gelatine with the name printed on it, I have a rubber stamp, with which I print the name, &c., direct on to the glass, doing away with the troublesome medium of the gelatine. I have no doubt that after we get a year or so's practice at it we will have the process simplified to a much greater extent. Silver printers have no conception of the beauties of this process. I could take in hand to convert the most conservative in half an hour. Convince will suit better than convert, as many would prefer to tell a direct falsehood to admitting of their conversion.

Mr. D. G. Munger is not the first who has put a little piece of hypo into a silver bath my mistake, and found that instead of spoiling the bath, it happened to be one of the finest they used. A friend of mine here, a Mr. James Martin, made a similar blunder a few years ago. He was telling me of it last summer. I tried it, not by mistake, but intentionally, and found it clean the bath to perfection; and for a long time it worked as well as any bath I ever saw, but it finally gave out, and all the tinkering I could do I could not make it work again. I think I may have put in too much soda; but I would recommend any having a bath out of order to drop a small piece of hypo into it, and set it in the sun to purify, when they will find they have got a bath fit for making chromotype negatives.

Correspondence

PORTABLE PHOTOGRAPHIC STUDIO.

SIR,—I shall be glad if any of your readers will render me information as to the best method of constructing above, to allow of its being taken down and re-erected as often as required. A side and top approaching a high side light would be preferred, and of average size. Suggestions would be much esteemed. W. H. M.

To Correspondents

J. H.—A small portion of insoluble residue, which deposits at the bottom of the bottle, is not uncommon with good samples of pyroxyline. If the collodion work well, and the residue is small, the matter is not serious; but if there be a large portion insoluble, something is wrong. In the formula we gave, no water should be added to the acids; but it is important to maintain the temperature as high as we mentioned. A thermometer should be used to test this. Here is another formula which we have used with advantage:—

Sulphuric acid 1.840	...	...	12 fluid ounces
Nitric acid 1.450	...	...	12 "
Water	...	...	3½ "

When these are mixed, the temperature will rise; when it is about 140°, immerse the cotton as before described, taking care that it is quite dry, as the weakened acids will not admit of the admission of further moisture.

W. S. S.—Carbonate of soda, which is the common article known as washing soda, is a decidedly alkaline salt. The bicarbonate of soda, which is most commonly used in operations where delicacy and purity are of importance, is also an alkaline salt. In any decomposition of the latter, carbonic acid is liberated, and this has an acid reaction; but the salt as a whole cannot have an acid reaction.

R. MORRIS DAY.—We do not know the price of Henslik's work on photo-collotype printing. We do not know of any one selling or publishing it in this country. It is printed in German. Presumably a foreign bookseller, such as Traubner, would procure it, if ordered of him.

H. G. P.—In the Autotype Manual you will find very fully detailed instructions for either printing on canvas with carbon powder, or transferring on to canvas. Satisfactory instructions would more than fill the space we can devote to answers. A special tissue is desirable. The ordinary painting canvas is secured well with a solution of soda, and then coated with gelatine. The operation of transferring is then conducted in the usual way.

J. BULLOCK.—The result, which is very definitely marked, is due to unequal shrinkage of the paper. See leader on the subject.

B. L. J.—A common cause of thin images is the use of a collodion of insufficient body. Try if that is the case by coating a portion of a film twice. If that portion be more dense than the rest of the image, it will indicate that a thicker collodion will give you more vigour in your negatives. Add, in that case, one grain per ounce of pyroxyline to the collodion. Sometimes a thin image is the result of the mode of applying the developer. If you dash it on the plate, so that it drives off all the free silver solution, your image will be thin, from want of deposited silver. Apply the developer gently, so as not to displace the silver solution on the plate. Avoid using the iron solution too strong. See, also, that the object is well illuminated.

D. W.—The streaks on the piece of negative forwarded are due to floating scum in the negative bath. Before commencing work, draw a strip of clean blotting paper over the surface of the bath until it is quite free from scum or greasy-looking patches floating on the surface. 2. The brown tone of the enclosed print is chiefly due to the use of a weak negative, which does not permit the blacks to be printed deep enough without over-printing the face. It is almost impossible to get rich tones in prints produced from such negatives. Vigour in the negative is an important element in securing a rich black tone in the print.

H.—You will find it more satisfactory to use hydrochloric acid than salt in precipitating the silver in your washing water. Take care to avoid adding unnecessary water, as the more dilute the solution is made, the slower and more troublesome the precipitation. The proportion of acid depends entirely on the silver present; but scum will do no harm. For every quart of washing water add five or six drops of acid. The question whether you should reduce the chloride and other residues yourself, or send to a refiner, is one of economy. If you have facilities, experience, and time, you will undoubtedly save something by doing it yourself. But in the majority of cases it is wiser to send to a refiner.

MAX.—You will ascertain full particulars on application to the Autotype Company.

WOULD-BE-CONTRIBUTOR.—An exhibition will be held, and medals offered; no details beyond this are decided.

LUX.—An ordinary sitting room with a bay-window about eight feet across will, used with skill and care, permit of the production of very fair portraits. Place the sitter about three or four feet from one end of the window, sitting on a chair slightly inclining to the window, with the head slightly turned from it. Place a white screen or a clothes-horse with a white sheet over it directly opposite to the window, and inclined in such position as will illuminate the shadowed side of the head with reflected light. We have seen very excellent portraits produced with such a light.

CONSTANT SUBSCRIBER.—The cause of the absence of richness in the tone of your print is not in the gold bath, or in the exciting bath, but in the negative, which lacks vigour and intensity. The tone of the print enclosed is indeed very good for a print from a somewhat weak negative. Unless you have sufficient force and intensity in the negative to permit the shadows to be printed very deep without over-printing the face, you will fall in securing that richness you desire. Try printing in the shade with your present negatives. That will improve matters a little.

A CONTINENTAL SUBSCRIBER is anxious to obtain photographic lantern slides of Staffa, Fingal's Cave, Giant's Causeway, and other geological subjects, also moveable astronomical subjects for demonstration purposes. Can any of our readers help him?

A CARELESS READER, who does not file his NEWS carefully, asks us to search out and repeat for him various formulae. We are always anxious to oblige our readers; but we regret that the pressure of our ordinary duties does not leave us time to save our correspondent the ordinary and legitimate care which he himself should exercise.

J. FRANKMAN.—Your photograph was registered on April 18th. The mention of photographs registered is often delayed when we are pressed for space.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. OTTENSEN, Luton,
Photograph of Mr. C. ROBINSON.
Mr. MANN, Berlin.
Four Photographs of Dr. MILLER.

The Photographic News, June 1, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE CAMERA AT THE WAR—THE IMPORTANCE OF A KNOWLEDGE OF LITHOGRAPHY IN LIGHT-DRUCK—THE BEHAVIOUR OF IODIDE OF POTASSIUM IN SUNLIGHT.

The Camera at the War.—At last special correspondents have begun to think of employing photography to help them in their arduous work. Why they have not done so before we cannot tell, for dry plates are not things of yesterday, and the camera, although it may not at times be able to replace the nimble pencil of the draughtsman, frequently gives results which are simply unattainable in any other way. Now, too, that we are possessed of a material like the Warnerke film, and there is no need of development on the spot, photography is especially suited for campaigning, and we wonder that more application has not been made of the art. Some weeks ago a very good example of what photography can do in a parallel case was afforded at a meeting of the Photographic Society. A series of negatives were shown, taken in North Africa near Cairo, which the photographer had not himself beheld. He had gone on his journey with a camera and a roll of sensitive tissue, and when he had exposed a score of times and had come to the end of his roll, he simply took it out of the dark slide and posted it to London, where the pictures were developed. It seems to us that war correspondents connected with illustrated papers would do well to adopt a similar *modus operandi*, and no doubt if they were only aware how easily pictures are taken now-a-days they would feel little hesitation in the matter. Mr. Alderman Nottage, of the Stereoscopic Company, who has resolved to despatch a correspondent to the battlefields of the East, has just adopted the roller dark slide for the equipment. Acting on the advice of Mr. Baden Pritchard, of Woolwich, who both as an amateur and one who has paid much attention to light equipment for reconnoitring purposes, Mr. Pocock, an officer of the London Stereoscopic Company, has been provided with the ingenious roller slide devised by M. Warnerke, and with that gentleman's tissue; he has already started on his journey, and without troubling himself in any way with the development of his pictures, will simply forward batch after batch as he takes them. A more simple arrangement can hardly be conceived, and as but few precautions are necessary to secure successful impressions, we may hope to see the energetic establishment of which Mr. Alderman Nottage is the chief publishing war photographs in a little while. It is very singular, in fact, that a very few war photographs have been published. Of the Franco-German battlefields we hardly remember seeing a single instance. A series of pictures were taken of Strasburg, during and after its investment, and also of Paris by the German staff of photographers, but those did not include any of the famous battlefields of the war. Photographs of the barricades thrown up by the Communists in Paris we have also seen, these pictures having a melancholy interest, since the portraits of officers and soldiers included in the photographs served afterwards for their conviction. But beyond a dozen prints of this kind, nothing of a photographic nature remains behind to tell the story of that significant war. On the other hand, of the China war of 1860 there are several battlefield photographs extant, pictures which at once bring home to the spectator the reality of a war. Of Abyssinia also there are some capital pictures extant, illustrating that laborious march of four hundred miles over a pass eight thousand feet above the level of the sea, and showing us exactly what the stronghold of King Theodore was like, as well as the nature of the native architecture, the churches, &c. Even of the Crimea we have some taking photographs—of the Redan, for instance, its state of destruction showing but too well how terrible was the struggle for its possession.

There cannot be a doubt, we think, that a series of photographs illustrating the battlefields of the East would be attractive just now, for if the public look at woodcuts and engravings, they will be sure to feel a desire to see veritable photographs taken on the spot.

The Importance of a Knowledge of Lithography in Licht-druck.—We have placed before our readers the most important points connected with Husnik's improved Licht-druck process, and we have shown that he places particular stress upon one innovation, namely, the use of soluble silicate. But one cannot help remarking that much importance is attached to good printing when it comes to using the press, and this leads us to remark once more upon the advisability of all photographers having a skilled lithographer to help them in carrying out a process of this kind. Lithographic printing is an art not learnt in a day, and if to be a collotype printer one must needs understand lithography, it is obviously of little good for a photographer to attempt the production of Lichtdruck prints without any knowledge of printing from stone first of all. Some years ago an illustration of this came under our notice. A well-practised photographer desired to take up the art of photo-lithography, and attained to some success as far as producing the transfer went, but somehow or other he never got any further. Either he produced a photo-transfer in which the image contained too much ink, and consequently got crushed on being transferred to stone, or there was not sufficient transfer ink, and then the image upon the stone failed in places. It never occurred to him that skill and experience of another kind entered into the matter, and he was considerably surprised when an ordinary lithographer was able to take up the matter where he left it, and to produce very good impressions. With a delicate process like Lichtdruck, the necessity for having a skilled printer is more marked still, and it would be contending with insuperable difficulties for anyone unacquainted with litho or zinco-graphic printing to attempt the production of fine Lichtdrucks. So much depends upon skilful printing, and in being able to resort to this or that expedient, that, as Husnik points out, success can hardly be acquired by one unskilled in surface printing. This will not, we hope, deter photographers in this country from attempting the charming process, for it is in this direction that progress in photo-mechanical printing undoubtedly lies. Lithographic printers are easily found, and their work is of a class that is not highly remunerated. Moreover, a few days or weeks spent under the tutorship of a good lithographer are very profitably spent, for now-a-days it behoves the photographer to know something of an art which is so closely allied to his own.

The Behaviour of Iodide of Potassium in Sunlight.—That iodide of potassium in solution changes its colour on exposure to daylight is a fact which many chemists have already noted. A French chemist, M. Vidau, in some experiments recently made upon the subject, has proved that the change is not due to light alone, but that the gases of the atmosphere have a decided influence in the matter. If a solution of iodide of potassium is exposed under ordinary circumstances to air and sunlight, the liquid rapidly becomes yellow, and, after a short time, is found to contain free iodine. But this is not the case if (a) the air is cut off, or (b) the sunlight is cut off. The solution exposed to sunlight in a vacuum undergoes no change, neither does it if exposed to air in the shade. M. Vidau concludes that sunlight and the acids of the air, and more especially carbonic acid, are the principal causes of the change, for he found that when a solution of the compound was exposed to sunlight in the presence of carbonic acid, decomposition went on far more rapidly than was the case when ordinary atmospheric air was present. A solution of iodide of potassium exposed to the action of sunlight and carbonic acid rapidly gave off free iodine; and

in two hours the solution was quite yellow, and gradually became darker. As iodide of potassium is a compound with which photographers constantly have to do, it is well to note its behaviour under the circumstances described.

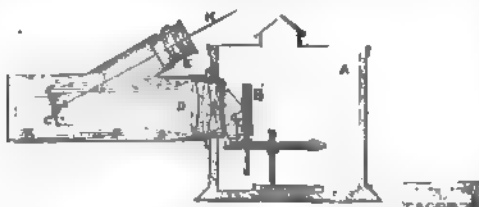
A NEW FORM OF MEGASCOPE.

BY J. B. KNIGHT.*

THE projection on the screen of the images of small opaque objects is often a very desirable means of illustrating lectures or papers read before societies, but has not been very largely employed, because of some difficulties attending its use.

As the light for forming the image is only that emanating or reflected from the surface of the object, it is important that it be strongly illuminated. The arrangement about to be described was devised to secure a better illumination than is obtained with the ordinary megascope, and at the same time save the cost of a special instrument, by utilizing the ordinary projecting lantern with which nearly all our educational institutions are provided.

The arrangement for accomplishing this purpose is shown in the accompanying cut, in which A represents the lantern box, B the lime, C the oxyhydrogen gas jet, and D, the condenser—all of the ordinary constituents. F represents a tube of sheet metal, of the proper size to fit snugly over the ring of the condenser, and of sufficient length to reach considerably beyond the focus of the beam of light from it. The object I is held, by the stage G,



in the beam of light, as near its focus as possible, and yet give the proper breadth of illumination. This stage G is supported by and hinged across its centre to the inner movable tube R. To the tube F is attached a branch for holding the focusing lens at the proper distance from the illuminated side of the object, with its axis at as small an angle from the axis of the condenser as will permit the cone of light passing from it to the screen to clear the top or sides of the lantern box. Objects are easily placed on the stage G by withdrawing the inner tube R, and are easily adjusted by this longitudinal movement and the angular movement of the stage on its hinges.

This attachment is simple and inexpensive, and by it the usefulness of the projecting lantern is greatly increased.

A PRACTICAL SUGGESTION.

BY W. E. HOSKEN.†

BETTER work is, I presume, what we are all striving to make, and doubtless are looking for help in that direction from *The Practical Photographer*. I, as one anxious to improve, should like to suggest a direction in which I think information is needed.

In looking through my collection of photographic literature (and I have copies of most that has been published), one is struck with the change that has taken place in the class of information given in the earlier and later works; in the one, it is all formula, page after page devoted to

developers, intensifiers, collodions, &c. Now, we get more suggestions how to use the formula we have, and more of art as applicable to photography. This evidently shows the direction of the thinkers among us who practice our art. I do not wish to decry the value of formulas; they are essential, especially so in all that pertains to new discoveries and improvements; but the day has gone by when we should look for the reason that A makes better pictures than B among A's pet formula. Such men as Kurtz, Sarony, and others of equal ability have given their formulas to the world, and we find them using the same as ourselves; but the results, how different! Elbert Anderson, in his work, very properly suggests the use of a chemical known as brains to mix with his formula; the advice is good, but would not be well, too, if such men could be induced to give us dilutions of their brain power, so that they might leaven us in practical suggestions adapted to every day work? Little matters, which are probably regarded as not of sufficient importance to be worth recording, go to make up that perfection which exceeds our own. Do chemicals mixed with brains ever get out of order, and refuse to yield perfect results? I presume they do, and then comes the addition of more brains, and lo! all is well. Yes, but it might be interesting and very beneficial to some of us to read a carefully written description of the difficulty (minute even to tediousness were better than so slight as to be unrecognizable) and how it was gotten rid of; by all means let us know how the demon was exorcised, for in that your *Practical Photographer* is most interested. Such men need fear no loss of reputation because of owning that things are not always well with them, especially when that oft-mentioned chemical has removed the trouble. Then, again, many of us, who do not pretend to be teachers, doubtless get into difficulties the learned never encounter, although they may have done so in years gone by. What better place to describe them than in our *Practical Photographer*—and get the benefit of others' brains to help us solve the problem, besides leaving them on record as a guide post to warn the unwary in the future?

Now, so as not to leave myself open to the charge of advising others to do what I myself fail in, I will describe a trouble I have met with lately, and only got rid of by discarding the bath I was using, and making a new one; and this is a rare occurrence with me, so rare that I can hardly ever tell how many years it is since I made the last, that is, wholly new—as I generally work it over when it gets out of order, add new silver to bring it up to the requisite strength, and go on satisfactorily. This particular bath has been served so a great many times. Some time ago the plates from the bath showed it to be greatly reduced in strength, although working clear (for fogging is a thing I am not troubled with, although I have encountered that enemy in times past to my heart's content). I removed it from service, and put it through the usual course of doctoring; neutralized, precipitated part of the iodide, boiled it to evaporate alcohol and ether, strengthened it with fresh silver, filtered, made it slightly acid with nitric acid, and they soon set it to work again. It worked clear as usual, but there seemed a disposition to form streaks and fine lines in the film. To me they were of an unusual character, not at all like streaks usually spoken of as "streaks in the direction of the dip" from bath and collodion not being in harmony, still following generally in the direction the plate was immersed; but they were fine transparent lines, seldom reaching clear across the plate, but commencing near the edge and reaching to the centre, and sometimes two-thirds of the way across, while sometimes others passed in from the other side; at times they formed a sort of ribbon mark, two fine transparent lines running nearly parallel to each other about an eighth to three-sixteenths of an inch apart, while between them the film was thinner than surrounding parts; occasionally the Old Nick seemed to pay in some one plate, and then we got a lovely result—fine lines and ribbons, and short ends

* *Journal of the Franklin Institute.*
† *Practical Photographer.*

of the ribbon marks crossing the others at different angles, forming a complete maze.

I will try to give an idea of the markings here in two cases, and if our editor is a genius with his pocket knife, he may furnish us a woodcut. You will observe, if my markings are reproduced, that there is another feature I have not yet mentioned, that is, innumerable small rings, the outside line semi-transparent, the inside like the ribbon marks, somewhat thinner than surroundings. At first I looked for the fault in my collodion, as my baths almost invariably work well until exhausted by loss of silver, and the collodion was a fresh supply; but changes in that direction did not work any improvement, so I made a new bath to take its place, and, "presto change," the enemy had vanished, root and branch—not a trace of it to be found. This trouble was not as bad at first as here represented, but kept growing worse; when I removed the bath, the hydrometer indicated thirty grains of silver to the ounce. Now, this may be a common and well understood difficulty to many, and if so I congratulate them on their acquaintance; but for my part, in the thirteen years I have followed the business for myself, I have never met the gentleman before, and do not wish to again, nor do I find it described in any photographic work or journal. I shall simply state a suspicion I have of the cause of the trouble. When I removed the bath, I found that the rubber dipper, which I had been using in it, was very much corroded. Before using it in the new bath, I thoroughly scraped it, and then varnished it with shellac varnish. Now, it may not have had any influence, but I am inclined to attribute to that corroded material of the rubber dipper, acting upon the film while in the bath, the cause of the trouble. In explanation, I must state that I dip a plate differently from many, always coating a plate with the film side in towards the dipper. These I prepare by warming and bending into a curve, so that the bottom and top edges of the plate only rest against them. I find (generally) in this mode of dipping a great immunity from specks and pinholes. If the editor does not consign this to the waste-basket, I should like to read the opinions of others on the trouble.

HUSNIK'S IMPROVED LICHTDRUCK.*

In order to produce Lichtdruck prints of the same tint as photographs there should be added to the lamp black some red varnish and carmine. These colours, however, change very soon, and the Lichtdruck, which is deemed so permanent, does not preserve its tone or beauty for a year. If the confidence of the public is to be secured, it will be necessary to exercise judicious care in the selection of suitable pigments. Fortunately these exist, and are easily obtained. Instead of the costly varnish, the dark violet, called *caput mortuum*, which is by no means expensive, costing but fourteen florins for two hundred pounds, may be employed and mixed with the finest black printing ink. This mixture gives very fine and perfectly permanent prints, which leave nothing to be desired. The best description of printing ink is sold in canisters of various sizes, the smallest being a pound canister costing from three to four florins. The colour is very fast, and may therefore be employed mixed with varnish, or as it is. It is at once to be distinguished from other inks, since it possesses a very black tone, and a yellow metallic lustre like Indian ink. Other black inks appear grey beside it. The genuine ink goes a long way, and gives deep blacks even when employed in a dilute form.

For Lichtdruck printing any paper almost may be used, sized or unsized, and with or without a facing of chalk; it may be any thickness, and should be chosen according to the nature of the work to be performed. Pictures on a large scale with broad details, or such as are to be employed as diagrams, or for instructional or scientific

purposes, should be printed upon good sized paper of considerable thickness. The impressions, as they come out of the press, are finished, and require no further treatment. They have the appearance of photographs printed upon salted or arrowroot paper. Prints having very fine or microscopic details, on the other hand, should be printed upon paper with a facing of chalk, which has a beautiful matt glaze, and furnishes prints that may compare with albumenized pictures. Papers which have no facing of chalk are printed in a moist condition, but no damping is applied to a chalk surface unless it has been sized.

The prints have a tendency to stick to the gelatine block, especially in the high lights, but this defect is at once avoided by using moistened paper. The paper, when wet, does not absorb moisture from the gelatine surface, and consequently never sticks. Using glycerine and water, instead of water, for moistening the paper, is an infallible remedy, and in summer especially is to be recommended.

The roller process formerly employed by Albert for Lichtdruck printing is now replaced by the ordinary lithographic press, which acts with a scraper. The most approved methods of lithographic printing are therefore applicable to the production of Lichtdrucks, the operator always bearing in mind that he has a more delicate material to deal with than the litho. stone. He should therefore adopt every precaution that is taken in delicate work in reference to pressure exerted, &c. Lithographic presses should be arranged for Lichtdruck printing, however, since there is a considerable difference in the two processes.

In printing from a lithographic stone, for instance, the paper must be energetically pressed against the printing surface, so that every portion of the paper may be forced into contact with the hard surface, and take up all the ink.

In printing from a gelatine surface it is different. In this case the block is soft and elastic, and comes halfway towards the paper; a slight pressure with the finger suffices, indeed, to ensure the paper taking up the ink from the gelatine surface. The ink, too, has a natural tendency to leave the wet gelatine surface, and this is one reason the more why very little pressure is necessary in Lichtdruck printing.

In order to protect the elastic gelatine block as much as possible, and to avoid pressing and maltreating it more than is necessary, special printing presses have been constructed, in which the pressure can be regulated by the hand with the greatest nicety. The scraper may be made of a far less solid nature than in the case of the ordinary litho. press, and in this way any unevenness in the glass or in the bed is not felt. Breaking of the glass and injury to the film are accidents which never occur in a well ordered and adapted press, and it is immaterial whether the glass plates employed are thick or thin. As, however, a thin plate is not so strong, and is not so easily submitted to the process of graining or polishing, it will be found advisable to make use, as a general rule, of plates of appreciable thickness.

Like the glazing of a photograph, the varnishing of a Lichtdruck is done simply to gratify the public taste. It is a weakness, but one which has frequently to be indulged if the Lichtdruck is to compete with the ordinary photograph for general favour. The print must be first of all covered with a gelatine solution before it is varnished. There are several stable varnishes in commerce, such as shellac, mastic, &c., which consist of gum resins dissolved in alcohol. After coating with or immersing in gelatine solution, the Lichtdruck is dried, and the varnish then applied, this being first of all mixed with some spirits of wine in order to take to the greasy image better, and also to avoid the formation of air-bubbles.

According to my experience, two parts of white shellac and one part of gum mastic dissolved in absolute alcohol give a suitable and inexpensive varnish for the purpose.

The varnishing must, however, be undertaken near a stove or fire, to prevent the film assuming a turbid, opaque character.

A very good suggestion as to the varnishing of Lichtdruck pictures has emanated from M. Martin, one of the members of the Vienna Photographic Society. That gentleman proposes the production of two gelatine printing blocks from every negative, and applying ink to one block and varnish to the other. Two printings are, as it were, required, a sheet of paper being first impressed with an image, which is afterwards varnished in the second press. This method of operating is quicker than varnishing each print by hand, but it has, moreover, another advantage: the high lights of the picture are not varnished at all, while the shadows have varnish applied in proportion to their intensity. The whites, being unvarnished, have no yellowish tint, and, consequently, appear fresher to the eye.

By adopting this method of varnishing, it would be possible to employ a thick turpentine varnish, which would have the effect of making the colour adhere more firmly to the paper; at the same time the margins would be preserved in their clean, untouched condition.

As regards retouching, it is recommended to do all that is possible upon the negative itself. If, however, any writing is required upon the gelatine block, then this may be done with a pigment to which a solution of tannin in water has been added. Lines, dots, or other marks made upon the gelatine block with this mixture of tannin will be printed off afterwards. The retouching may also be done by the aid of bichromate of potash solution.

[In another article, we propose to give a summary of the manipulations and defects incident to Lichtdruck.—Ed. P. N.]

BINOCULAR VISION EXPERIMENTS.

BY FRANCIS E. NIPHER.

It is possible that the phenomena here described may have been observed before, but I have been unable to find any record of them.

1. Fold a sheet of writing-paper into a tube about an inch in diameter. Look through the tube at some distant object with one eye, and toward the open hand with the other eye, the edge of the hand being in contact with the tube. The dissimilar objects producing unlike images upon the retinae, the sensations blend, and a hole will appear to be cut through the palm of the hand, through which the tube passes. That part of the tube between the eye and hand will appear to be transparent, as though the hand was seen through it. This experiment is very old, but seems not to have found its way into scientific literature.

2. Replace the hand by a sheet of unruled paper, upon which a drop of ink has been placed. By proper management, the ink blot may be made to appear within the tube, by so placing the paper that the hole, which is apparently cut through it, coincides with the blot. Ordinarily the blot will then appear opaque, the paper immediately around it, and apparently within the tube, being invisible. The blot appears, as it were, suspended in space. By concentrating the attention strongly on objects seen through the tube, especially if they are strongly illuminated, the blot becomes more hazy, transparent, and may even be made to disappear altogether. The mental effort necessary to do this cannot be maintained more than a few seconds, and the spot will re-appear. If the effort to cause the spot to thus disappear be kept up, the attention being strained to its highest pitch, the blot will disappear and re-appear at regular intervals of a few seconds, the absolute time depending upon the illumination. It seems as though the organs exerted become fatigued, and, relaxing for a few moments, refreshment sets in, which again renders possible the exertion necessary in causing the blot to disappear. It is possible that these experiments may be so made as to throw some light upon the conditions necessary in fixing the attention.

Interesting experiments may also be made by substituting a fragment of a plane mirror for the sheet of paper. Looking through a rather large tube at a distant object with the right eye, the reflected image of the left eye will appear staring up the tube, the adjoining parts of the head being invisible.

3. Substituting for the ink blot a small hole cut through the paper, the small hole can also be made to appear within the tube, distinguishing itself by its different illumination, the surrounding paper being invisible, unless attention be directed too strongly to the paper in which the hole is cut. The relative illumination of the small hole, and the space immediately around it, depends upon the relative illumination of objects upon which the tube is directed, and that of the sheet of paper exposed to the other eye.

4. Keeping the same arrangement, place at a distance of one foot from the end of the tube a sheet of paper, so that objects beyond it are still visible; arrange matters so that it is visible to the eye looking through the tube, but not to the other directed at the small hole in the paper sheet. This second sheet will now appear to be traversed by a hole the same in size as that cut through sheet No. 1.

Cutting a small hole in sheet No. 2, matters are easily arranged so that it appears within the hole which was before seen within the tube. These experiments may be utilized in showing the simultaneous accommodation of the two eyes.

5. Tubes of this kind, blackened on the inside, are very convenient in studying colour sensations. Using two such tubes, look through one with the right eye (say) at red, through the other with the left eye at green paper, illuminated by the direct solar ray. The colour sensations fade with marvellous quickness. Transferring both eyes to either colour (say red), the eye, fatigued by green, sees the red greatly intensified, the effect being rendered the more striking by the simultaneous impressions received by the two eyes. Experiments in the combination of colour sensations will readily suggest themselves.—*American Journal of Science.*

LANDSCAPE AND ARCHITECTURAL PHOTOGRAPHY.

BY S. R. STODDARD.*

I HAVE often felt that "instructions for beginners" were of a nature only to be understood after the point was reached where beginners could do without the instructions, and if it displays a lack of scientific accomplishments to make the acknowledgment, I must still say that I write my formulae in the commonest kind of English, and aim to simplify the work to the extreme of simplicity.

The Glass is cut the required size, and allowed to remain in pickle (one quart sulphuric acid to one gallon water) for two or three days, then washed under a tap, albumenized, (solution: white of an egg to about twenty-four ounces water), and set on edge in a rack to dry. When dry it is marked in one corner with india-ink, to show which side is coated, done up in dozens, wrapped in two thicknesses of paper, and securely pasted to keep free from dust, then stored away for future use.

The Bath is made up to test, forty-five grains of silver to the ounce of water, enough collodion added to cover the largest plate used in the given quantity of solution, and all placed in the sun to purify. When clear, filter and use.

Collodion.

Alcohol	...	...	...	10 ounces
Ether	...	...	...	10 "
Iodide of ammonium	...	...	...	100 grains
Bromide of cadmium	...	...	...	20 "
Gum-cotton	...	...	...	about 100 "

(I usually keep on hand one or two kinds of standard collodion, to use in case mine fails to work).

Lenses.—I usually carry four pairs, varying from two and

a half to ten inches focal length, for stereoscopic work, and a ten-inch Morrison for single views, each fastened on its separate front, fitted to my camera, and all contained in a light wooden box with space for each. This box I carry in my hand to each point of view, and select lenses to suit the subject, invariably choosing the longest-focussed instrument that can be used in the prescribed limits, as wide angles fill the foreground with unimportant objects, and dwarf stately mountains down to insignificant lines.

For Landscapes I prefer single (achromatic) lenses, as the slight curvature at the margin is ordinarily of no account, and more than compensated for by the greater sharpness and detail obtained. They are also (when perfectly clean) free from a trouble which sometimes goes with the very best of combination lenses, a centralization of light, and a fuzziness at the edges where a dark object is brought against a strong light. Some of my best work has been produced with a pair of object-glasses taken from an ordinary opera glass (three-inch focus), mounted in rigid settings, and properly diaphragmed in front.

For Architectural Work something better is needed, and found in the "Morrison" and "Dallmeyer" wide-angle rectilinear lenses, which take in an angle of nearly a hundred degrees; they are expensive, but invaluable and perfect in their way. In my mind, there is little choice between them; and an outfit would be incomplete without a pair of either one kind or the other, two and a-half inch focus for confined situations, interiors, or mountain gorges and waterfalls, such as I have often found among the Adirondacks. Of course, the rule requiring as long a focussed instrument as possible holds good, and applies with even greater force to architectural subjects; but this smaller kind of lens is often necessary for field work simply because a single lens cannot be found of sufficiently wide angle.

For Instantaneous Work a pair of portrait tubes, thirds or quarters, are best. I have used a pair, four-inch focus, manufactured for the trade under various names, but called by Benjamin French and Co., of Boston, their "new stereoscopic lenses, imitation Dallmeyer." They are good for groups, heads, &c.

Tripod.—For light work I made a tripod of ash, four and a-half feet long, turned in a lathe, one and five-eighths inches thick at its largest, and tapering gradually from centre to bottom. It was then split in six pieces with a fine saw. The pieces, when smoothed and bound in pairs about half way up, formed a round bundle, which, fitted with a light top of the ordinary viewing pattern, is nearly as firm as the clumsier article, and, when folded, but little heavier than a large cane.

For Travelling by rail, I have two small trunks, padded for chemicals, glass, &c. The dark-box we can carry in one hand, or, if necessary to put in the baggage car, I find that a silver half or quarter dollar laid on top of the box is a much better protection than rubber corners.

For going about the country, I have a roomy carriage, for one horse, with top (the carriage, not the horse), and rubber blanket, fitted over the dasher, coming in front nearly up to a level with the eyes. One, also, from the seat extends back over the ample body, where everything can be kept dry and secure even in the severest storms.

The Dark-box is secured at the back end, resting on a light iron frame or boot similar to those on the rear of stages. When driving, the box is closed and carried upright. When work is to be done, a strap is loosened; a part drops over back at a proper height to be worked handily from the ground, the top is extended, and we are ready for work. The same box can be taken from the carriage by simply loosening a nut. It has solid legs (two of them regulated by set screws, as I do not like the tripod arrangement for the dark-box—it's tempting providence too far), and straps for the shoulders, by which it can be easily carried.

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Arrived at the place to be covered, I secure the services of some boy—sometimes two—choosing one who looks as though he was wide awake, and with an extra inducement for quick time, set him to running with plate-holders between the camera and dark-box. You who have climbed hills or "scooted" across fields under a hot sun, to make a distant exposure, perhaps to find your tripod upset by a passing breeze, and returned with the plate to plunge your head into what, in your then condition of blood, seemed as hot as an oven, and about as dark to your contracted pupils, and in the end spoil the negative in consequence of your unstrung nerves, will bless and appreciate that boy; and when the work is done, and you look at that boy, covered with dust, and perspiration, and glory and silver, you cannot refuse him good pay for his day's work, and your own work will be better, too, for you have kept a clear, cool head at your work all the time. We use three or four plateholders; they often passing each other on the way to or from the camera, and where long exposures are necessary, one is often prepared and ready to be exposed immediately the other is taken away. After developing (one ounce protosulphate of iron, pint of water, and acetic acid to make it flow easily), the negative is flowed with—

Preservative, composed of two ounces glycerine, four ounces acetic acid, and ten ounces water, and placed in a negative box to await further action. This

Negative box is made of sheet copper, nine inches high, six inches one way, and deep enough the other to allow five by eight negatives to slide easily in separate grooves, made of strips or troughs of copper soldered fast, and affording space for thirty-two negatives. When through with the day's work, or sooner if necessary, the negatives are removed, washed, fixed (I use cyanide), washed again, and placed in the ordinary wooden negative box. I place a strip of wood across the bottom of the copper box to lift the negative above any of the preservative that may gather there, and guard against a possible stain. The cover shuts over the upper edge, and is lined with rubber to make it tight, fastened with a hasp and wooden pin. In this manner they may be kept several days without drying, and the necessity of carrying water is entirely done away with.

Redeveloper.—If weak, I place the negative (at any time after it is dry, and in daylight) back in the bath for a few seconds, then redevelop with ordinary iron developer, about one-half the usual strength, adding a little more acetic acid if it crawls when poured on.

After varnishing, I cut my stereo negatives, and fasten on other glass at the edges with gummed paper, placing the right-hand picture on the left side, to save the trouble of transposing the prints in mounting.

The Names.—Secure fine writing paper (the kind known as "onion skin" I have found best), have the names printed with the best of black ink, and all the type will bear without filling up (and, by the way, the type should be new and clean, at least not worn round the edges); let this get thoroughly dry, then cut out close to the letter, lay on the negative face down where it is designed to go, and, with a small brush, apply at the edge some kind of adhesive medium which will flow readily under the paper, make it transparent, and at the same time not disturb the surface of the negative or of the letter. I have found diamond varnish the best thing so far.

The negatives I keep in long grooved boxes, set up one on the other like shelves. Each negative is numbered from one up, and has its corresponding place in the box. I have a large book containing the views arranged in numerical order (extremely handy to select from and in making out printing lists), and large cupboards with pigeon-holes arranged in the same way to contain the finished pictures.

The varnishing must, however, be undertaken near a stove or fire, to prevent the film assuming a turbid, opaque character.

A very good suggestion as to the varnishing of Lichtdruck pictures has emanated from M. Martin, one of the members of the Vienna Photographic Society. That gentleman proposes the production of two gelatine printing blocks from every negative, and applying ink to one block and varnish to the other. Two printings are, as it were, required, a sheet of paper being first impressed with an image, which is afterwards varnished in the second press. This method of operating is quicker than varnishing each print by hand, but it has, moreover, another advantage: the high lights of the picture are not varnished at all, while the shadows have varnish applied in proportion to their intensity. The whites, being unvarnished, have no yellowish tint, and, consequently, appear fresher to the eye.

By adopting this method of varnishing, it would be possible to employ a thick turpentine varnish, which would have the effect of making the colour adhere more firmly to the paper; at the same time the margins would be preserved in their clean, untouched condition.

As regards retouching, it is recommended to do all that is possible upon the negative itself. If, however, any writing is required upon the gelatine block, then this may be done with a pigment to which a solution of tannin in water has been added. Lines, dots, or other marks made upon the gelatine block with this mixture of tannin will be printed off afterwards. The retouching may also be done by the aid of bichromate of potash solution.

[In another article, we propose to give a summary of the manipulations and defects incident to Lichtdruck.—Ed. P. N.]

BINOCULAR VISION EXPERIMENTS.

BY FRANCIS E. NIPHER.

It is possible that the phenomena here described may have been observed before, but I have been unable to find any record of them.

1. Fold a sheet of writing-paper into a tube about an inch in diameter. Look through the tube at some distant object with one eye, and toward the open hand with the other eye, the edge of the hand being in contact with the tube. The dissimilar objects producing unlike images upon the retinae, the sensations blend, and a hole will appear to be cut through the palm of the hand, through which the tube passes. That part of the tube between the eye and hand will appear to be transparent, as though the hand was seen through it. This experiment is very old, but seems not to have found its way into scientific literature.

2. Replace the hand by a sheet of unruled paper, upon which a drop of ink has been placed. By proper management, the ink blot may be made to appear within the tube, by so placing the paper that the hole, which is apparently cut through it, coincides with the blot. Ordinarily the blot will then appear opaque, the paper immediately around it, and apparently within the tube, being invisible. The blot appears, as it were, suspended in space. By concentrating the attention strongly on objects seen through the tube, especially if they are strongly illuminated, the blot becomes more hazy, transparent, and may even be made to disappear altogether. The mental effort necessary to do this cannot be maintained more than a few seconds, and the spot will re-appear. If the effort to cause the spot to thus disappear be kept up, the attention being strained to its highest pitch, the blot will disappear and re-appear at regular intervals of a few seconds, the absolute time depending upon the illumination. It seems as though the organs exerted become fatigued, and, relaxing for a few moments, refreshment sets in, which again renders possible the exertion necessary in causing the blot to disappear. It is possible that these experiments may be so made as to throw some light upon the conditions necessary in fixing the attention.

Interesting experiments may also be made by substituting a fragment of a plane mirror for the sheet of paper. Looking through a rather large tube at a distant object with the right eye, the reflected image of the left eye will appear staring up the tube, the adjoining parts of the head being invisible.

3. Substituting for the ink blot a small hole cut through the paper, the small hole can also be made to appear within the tube, distinguishing itself by its different illumination, the surrounding paper being invisible, unless attention be directed too strongly to the paper in which the hole is cut. The relative illumination of the small hole, and the space immediately around it, depends upon the relative illumination of objects upon which the tube is directed, and that of the sheet of paper exposed to the other eye.

4. Keeping the same arrangement, place at a distance of one foot from the end of the tube a sheet of paper, so that objects beyond it are still visible; arrange matters so that it is visible to the eye looking through the tube, but not to the other directed at the small hole in the paper sheet. This second sheet will now appear to be traversed by a hole the same in size as that cut through sheet No. 1.

Cutting a small hole in sheet No. 2, matters are easily arranged so that it appears within the hole which was before seen within the tube. These experiments may be utilized in showing the simultaneous accommodation of the two eyes.

5. Tubes of this kind, blackened on the inside, are very convenient in studying colour sensations. Using two such tubes, look through one with the right eye (say) at red, through the other with the left eye at green paper, illuminated by the direct solar ray. The colour sensations fade with marvellous quickness. Transferring both eyes to either colour (say red), the eye, fatigued by green, sees the red greatly intensified, the effect being rendered the more striking by the simultaneous impressions received by the two eyes. Experiments in the combination of colour sensations will readily suggest themselves.—*American Journal of Science.*

LANDSCAPE AND ARCHITECTURAL PHOTOGRAPHY.

BY S. E. STODDARD.*

I HAVE often felt that "instructions for beginners" were of a nature only to be understood after the point was reached where beginners could do without the instructions, and if it displays a lack of scientific accomplishments to make the acknowledgment, I must still say that I write my formulæ in the commonest kind of English, and aim to simplify the work to the extreme of simplicity.

The Glass is cut the required size, and allowed to remain in pickle (one quart sulphuric acid to one gallon water) for two or three days, then washed under a tap, albumenized, (solution: white of an egg to about twenty-four ounces water), and set on edge in a rack to dry. When dry it is marked in one corner with india-ink, to show which side is coated, done up in dozens, wrapped in two thicknesses of paper, and securely pasted to keep free from dust, then stored away for future use.

The Bath is made up to test, forty-five grains of silver to the ounce of water, enough collodion added to cover the largest plate used in the given quantity of solution, and all placed in the sun to purify. When clear, filter and use.

Collodion.

Alcohol ...	...	...	10 ounces
Ether ...	...	...	10 "
Iodide of ammonium ...	...	...	100 grains
Bromide of cadmium ...	...	...	20 "
Gau-cotton ...	...	...	about 100 "

(I usually keep on hand one or two kinds of standard collodion, to use in case mine fails to work).

Lenses.—I usually carry four pairs, varying from two and

* *Philadelphia Photographer.*

a half to ten inches focal length, for stereoscopic work, and a ten-inch Morrison for single views, each fastened on its separate front, fitted to my camera, and all contained in a light wooden box with space for each. This box I carry in my hand to each point of view, and select lenses to suit the subject, invariably choosing the longest-focussed instrument that can be used in the prescribed limits, as wide angles fill the foreground with unimportant objects, and dwarf stately mountains down to insignificant lines.

For Landscapes I prefer single (achromatic) lenses, as the slight curvature at the margin is ordinarily of no account, and more than compensated for by the greater sharpness and detail obtained. They are also (when perfectly clean) free from a trouble which sometimes goes with the very best of combination lenses, a centralisation of light, and a fuzziness at the edges where a dark object is brought against a strong light. Some of my best work has been produced with a pair of object-glasses taken from an ordinary opera glass (three-inch focus), mounted in rigid settings, and properly diaphragmed in front.

For Architectural Work something better is needed, and found in the "Morrison" and "Dallmeyer" wide-angle rectilinear lenses, which take in an angle of nearly a hundred degrees; they are expensive, but invaluable and perfect in their way. In my mind, there is little choice between them; and an outfit would be incomplete without a pair of either one kind or the other, two and a-half inch focus for confined situations, interiors, or mountain gorges and waterfalls, such as I have often found among the Adirondacks. Of course, the rule requiring as long a focussed instrument as possible holds good, and applies with even greater force to architectural subjects; but this smaller kind of lens is often necessary for field work simply because a single lens cannot be found of sufficiently wide angle.

For Instantaneous Work a pair of portrait tubes, thirds or quarters, are best. I have used a pair, four-inch focus, manufactured for the trade under various names, but called by Benjamin French and Co., of Boston, their "new stereoscopic lenses, imitation Dallmeyer." They are good for groups, heads, &c.

Tripod.—For light work I made a tripod of ash, four and a-half feet long, turned in a lathe, one and five-eighths inches thick at its largest, and tapering gradually from centre to bottom. It was then split in six pieces with a fine saw. The pieces, when smoothed and bound in pairs about half way up, formed a round bundle, which, fitted with a light top of the ordinary viewing pattern, is nearly as firm as the clumsier article, and, when folded, but little heavier than a large cane.

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The Photographic News.

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INSTANTANEOUS PHOTOGRAPHY.

A SERIES of articles have recently appeared in the *Bulletin de la Société Française*, from the pen of M. Sahler, on the above subject. M. Sahler seems to have made a profound study, both theoretically and practically, of the subject he has taken up, and we now place before our readers, by way of summary, the formulae recommended by that gentleman to secure pictures with rapid exposures.

Accelerating Liquid.—Into a bottle capable of holding one-tenth of a litre are put sixty cub. cents. of alcohol and one gramme of iodide of cadmium; then drop by drop is added sufficient ammonia until the last drop brings about the slightest turbidity. The clear liquid is poured off, eight cub. cents. of rectified alcohol are added, together with five drops of a saturated solution of nitrate of ammonia, and the liquid is then stirred, while drop by drop so much glacial acetic acid is put in to render the liquid clear again, only leaving at the bottom of the vessel a small precipitate of hydrate of cadmium.

Collodion.—Five grammes of collodion pyroxyline are weighed; this is put into a wide-mouth bottle and well corked, where it remains a month. The pyroxyline then begins to decompose and gives off acid vapours, and as soon as these are apparent by the smell, the product may be employed.

A litre bottle is taken, and into it are poured three hundred cub. cents. of alcohol; in this are dissolved nine grammes of iodide of cadmium, and then the five grammes of decomposed pyroxyline, together with another five of undecomposed cotton, are added. Stirring the while, there is added by degrees ether (of 62°) enough to dissolve the pyroxyline. Finally, the bottle is filled with a mixture of alcohol and ether.

The collodion is tested by pouring some of it upon a glass plate. If the film is not stout enough, a little pyroxyline is added; if it is ropy, more alcohol should be added. Then, in the open air (to prevent one breathing the injurious fumes), thirty drops of bromine are permitted to fall into the bottle.

The decomposition products of the pyroxyline oxidize the alcohol and change it into aldehyde; the iodine displaced by the bromine combines with the nitrogenous oxides, when a similar noise will be heard to that made by a hot iron being thrust into water. Iodate of chromium is formed, which subsequently combines with ammonia.

The accelerating liquid is shaken up, allowed to remain for five minutes, so that any coarse particles may sink to the bottom, and then three-fourths of the contents of the bottle is poured into the collodion. If the latter becomes turbid, it is filtered, and then two drops of ammonia are added.

If the collodion does not become colourless within ten days, then one or two drops of ammonia are added. It does not matter if it is a little turbid. It is put into long narrow bottles and permitted to stand until it is clear. It should be of a light yellow colour; if colourless, it is tinted before use every time with a few drops of tincture of iodine. It will keep good a very long time.

If the pyroxyline has been too much decomposed, the collodion will not adhere to the glass; a little ordinary iodized collodion is then added to it. When the collodion grows very old its sensitiveness may be materially increased by the addition of one or two drops of the under-mentioned reducing fluid. In fifty grammes of alcohol are poured six drops of aldehyde and three drops of ammonia. This solution must remain some days before it is used. Still more sensitive becomes the collodion by the addition of one or two drops of an extra accelerating fluid, composed as follows:—Into fifty grammes of alcohol are put eight drops of aldehyde and three decigrammes of caustic potash; after standing a fortnight the fluid becomes of a dark brown colour, and ready for use. The collodion is allowed to remain for some hours, and before use the upper portion is poured off.

The so-called Mann pyroxyline does not yield any acid fumes on keeping. When this is mixed, there should be added, before the iodide of cadmium is employed, eight drops of the extra-accelerating fluid to the alcohol, and no ammonia afterwards.

Dry Collodion.—The collodion above described requires no covering or preservative. Its sensitiveness is improved by a solution of fifteen centigrammes of resin for every hundred cub. centimetres of collodion. The maximum sensitiveness of this collodion is, however, reached by employing with it a solution of tannin.

The developer, and mode of treating the negative, will be given hereafter.

INCONGRUOUS COMBINATION IN PHOTOGRAPHS.

At a recent meeting of the Chicago Photographic Association a paper was read by Mr. P. B. Greene, criticizing the art qualities of a photograph illustrating an American journal. After severely condemning it as the poorest picture he ever saw, and expressing a conviction that such illustrations did more harm than good, he went on to remark:—

"Almost any subject will make a good picture if properly handled, but always choose the best when they are to be found. One of the worst errors photographers have made during the few years past is the use of too many accessories and scenery backgrounds. I have yet to see the first photograph where the drawing and lighting in the scenery background agrees with the figure or subject of the picture. The same fault is plainly to be seen in all landscape views, where the sky has been printed in with another negative. If our journals would give a good, honest criticism, pointing out the faults as well as the good qualities in the pictures they use for illustration, photographers would be benefited. A poor photograph, honestly criticised, is many times quite as instructive as good ones.

"In closing this paper, I wish to call your attention to a criticism of Ruskin, on one of Claude's paintings, and which I think can be profitably considered while studying our illustration: 'The False Idea of Landscape.—The Mill, by Claude.' The foreground is a piece of very lovely and perfect forest scenery, with a dance of peasants by a brookside; quite enough subject to form, in the hands of a master, an impressive and complete picture. On the other side of the brook, however, we have a piece of pastoral life: a man, with some swes and goats, tumbling head foremost into the water, owing to some sudden paralytic affection of all their legs. Even this group is

one too many; the shepherd has no business to drive his flock so near the dancers, and the dancers will certainly frighten the cattle. But when we look farther into the picture, our feelings receive a sudden and violent shock by the unexpected appearance, amidst things pastoral and musical, of the military: a number of Roman soldiers riding in on hobby-horses, with a leader on foot, apparently encouraging them to make an immediate and decisive charge on the musician. Beyond the soldiers is a circular temple, in exceedingly bad repair, and close beside it, built against its very walls, a neat water-mill, in full work. By the mill flows a large river, with a weir across it. The weir has not been made for the mill (for that receives its water from the hills by a trough carried over the temple); but it is particularly ugly and monotonous in its line of fall, and the water below forms a dead-looking pond, on which some people are fishing in punts. The banks of this river resemble in contour the later geological formation around London, constituted chiefly of broken pots and oyster shells. At an inconvenient distance from the water side stands a city, composed of twenty-five round towers and a pyramid. Beyond the city is a handsome bridge, part of the campagne with fragments of aqueducts; beyond the campagne, the chain of the Alps; on the left, the cascades of Tivoli.

"This is, I believe, a fair example of what is commonly called an 'ideal' landscape—i.e., a group of the artist's studies from nature, individually spoiled, selected with such opposition of character as may insure their neutralizing each other's effect, and united with sufficient unnaturalness and violence of association to insure their producing a general sensation of the impossible. Let us analyze the separate subject a little in this ideal work of Claude's.

"First, we will reduce the multitudinous precipices of the Appennines to four sugar-loaves. Secondly, we will remove the Alban Mount, and put a large dust heap in its stead. Next, we will knock down the greater part of the aqueducts, and leave only an arch or two, that their infinity of length may no longer be painful from its monotony. For the purple mist and declining sun we will substitute a bright blue sky, with round white clouds. Finally, we will get rid of the unpleasant ruin in the foreground; we will plant some handsome trees therein; we will send for some fiddlers, and get up a dance and a picnic party.

"It will be found throughout the picture that the same species of improvement is made on the material which Claude had ready to his hand. The descending slopes of the city of Rome, toward the pyramid of Caius Cestius, supply not only lines of the most exquisite variety and beauty, but matter for contemplation and reflection in every fragment of their buildings. This passage has been idealized by Claude into a set of similar round towers, respecting which no idea can be formed but that they are uninhabitable, and to which no interest can be attached beyond the difficulty of conjecturing what they could have been built for.

"The ruins of the temple are unimpressive by the juxtaposition of the water-mill, inexplicable by the introduction of Roman soldiers. The glide of the muddy stream of the melancholy Tiber and Anio through the campagne is impressive in itself, but altogether ceases to be so when we disturb their stillness of motion by a weir, adorn their neglected flow with a handsome bridge, and cover their solitary surface with punts, nets and fishermen."

PRIZES OFFERED BY THE VIENNA PHOTOGRAPHIC SOCIETY.

THE Vienna Photographic Society offers the following prizes for the solution of various problems connected with photography:—

a.—Voigtlander Medals.

1. A gold medal worth 140 ducats for a method of increasing the sensitiveness of wet plates.
2. A gold medal worth 140 ducats for a certain and rapid dry process of superior excellence.
3. A gold medal of 40 ducats for a thorough research into the asphaltes.
4. A silver medal for a collection of natural history studies.
5. A silver medal for a collection of instantaneous pictures.
6. A silver medal for a collection of lantern transparencies, for illustrating science, art, or technical matters.
7. Medals in gold (of a value from 40 to 100 ducats), silver, and bronze, for scientific research, inventions, or improvements, which are communicated to the Society or to its organ.

b.—Society's Medals.

1. Gold medal of 140 ducats for the production of type blocks having half-tones.
2. A gold medal of 140 ducats for a critical study of the reactions of chrome acids and their salts upon albumenates, albumenoids, carbon hydrates, and resins, with particular reference to the different heliographic processes.
3. A silver medal for *genre* pictures.
4. A silver medal for carbon prints produced in Austro-Hungary.
5. A silver medal for a collection of monuments.
6. A silver medal for a collection of ethnological studies.
7. A silver medal for a collection of anthropological studies.

Competitors must qualify by becoming members of the Society. Further particulars may be obtained by addressing the President, Dr. Hornig, Vienna III, Hauptstrasse 9.

THE CARBON PROCESS OF TO-DAY.

BY W. E. BATHO.*

AFTER the paper which forms the support of the image is washed off, the gradual appearance of the hitherto obscured image possesses all the charm peculiar to the development of a wet plate. In the case of under-exposure, little or nothing can be done; it is better to start again. Should the print prove over-exposed, the use of water at a higher temperature will reduce the print; but a better and safer way will be to keep the water at one steady temperature, and add a few drops of ammonia. This, in my experience, reduces the print in a more uniform manner than hot water or long soaking—that is, the more delicate shades do not go so soon as with other treatment. Yet the method for reducing a carbon print with such uniformity as to give a result similar to that resulting from correct exposure has yet to be published. The developed picture is washed with cold water, the fixing with a solution of alum follows this, again washed, then dried spontaneously.

Any spotting required is done when all is ready for the transfer. In this operation a little thought will supply the information necessary to overcome all difficulties. The pictures being formed of various thicknesses of gelatine, shown by the dark parts being in relief, there is a danger of the transfer paper not being pressed into all the hollows, to bridge over, as it were, from point to point, and so cause a defective print, shown by white lines running close to the outlines of a dark or elevated portion. The transfer paper should be made quite slimy, so as to enable the operator to mould it to the picture, and ensure absolute contact. Sometimes a transfer paper either has not sufficient gelatine thereon, or has become exceedingly hard by long keeping, so that it cannot be got into the required state. In this case dipping the paper into a solution of gelatine at the time of using proves a

* Continued from page 258.

remedy; sufficient adheres to the paper to fill up the hollows of the print, and so brings the print and paper into contact.

It seems to me that in the manufacture of a transfer paper attention should be given to the selection of a right material upon which to spread the gelatine, for the grain of the transfer paper sometimes shows unpleasantly in the whites. Should even a higher price have to be paid, the use of a fine paper is advisable. Another way of arriving at the same end is to load the gelatine with a white pigment to hide the grain of the paper. I have chosen sulphate of barium, which was produced in the warm solution of gelatine already containing a soluble baryta salt, by the addition of a soluble sulphate; this method enabled me to use what would otherwise have been a paper altogether too rough for fine work.

The transfer paper having been applied, it is allowed to become surface dry, when it is well starched. The mount, previously damped between blotting boards, is also starched and pressed into contact with the paper. This is then placed under pressure for some time, and allowed to dry, when the print will come off; it can then be trimmed as the fancy dictates.

I have said the mounted print is left under pressure for some time—this may mean a few minutes or a few days. It appears, however, that a print dried rapidly has not so fine a surface as one dried slowly, and the length of time the print is under pressure prolongs the time of drying, owing to the necessarily slow evaporation.

That there are difficulties in the way of pigment printing the most violent carphophile will admit. To calmly meet them is the surest way to success; to ignore their existence is not an evidence of sanity. That it has difficulties ought not to be a source of regret, for when the public are educated to prefer the permanent to the fleeting, the very difficulty of meeting the want will tend to weed out, by a process of selection, those not suited to the times. Be this as it may, I do not envy the man who has so little sound interest in the advancement of our art science as not to wish every success to the carbon process.

CARBON TRANSPARENCIES FOR ENLARGEMENTS.*

The diapositive to be employed for enlarging purposes must be differently constituted to pictures intended for window ornaments, lamp shades, and the like. Instead of a vigorous and plastic diapositive of agreeable tone, which is quite opaque in the deepest shadows, it is necessary to produce a thin and delicate image, which will allow the light to pass through everywhere. Such an image is not to be obtained with black tissue employed for ordinary stereoscopic pictures and stereoscopic slides, and which contains a great deal of pigment, but requires a tissue with a finely ground pigment, in which there is a good deal of carmine and Venetian red, and very little bone black.

Its preparation in the bichromate bath is the same as that of ordinary tissue. As it comes out of the bath it is put face downwards upon a well-cleaned glass plate, covered with a piece of waterproof material, and scraped with the squeegee. It is permitted to remain upon the glass plate for five minutes, and is then drawn off and hung up to dry. Its exposure under the negative takes about half as long again as is the case with a paper positive.

The imprinted tissue is moistened in the ordinary way, and placed upon a well-cleaned and faultless plate of glass, the squeegee being pressed upon the impression to ensure its adhesion. In this case the plate is not rubbed with wax; on the other hand, it may be previously coated with very thin structureless normal collodion, and laid in water until the fatty marks disappear, when the tissue is adjusted in the usual way.

The best results are secured, however, it seems, by the use of a glass plate which is coated with gelatine instead of collodion. The so-called reticulation, or network markings of the tissue which sometimes appear (and which are due to the temperature at which the tissue has been dried, although the phenomenon also seems inherent to certain classes of gelatine) are then never to be met with. As the quality of the enlargement depends upon the nature of the diapositive, every defect in the latter becoming enlarged, it is well to employ a gelatine coating whenever this reticulation is apparent even in the slightest degree. The plate is in this case carefully cleaned and dusted, and then the gelatine solution is prepared as described by Mr. Willis, in Wharton Simpson's YEAR-BOOK, 1876. Twenty-six grammes of Nelson's gelatine are put into eight hundred grammes of cold water, and after the lapse of an hour the vessel is placed in hot water; the gelatine then dissolves. Next, in one hundred and sixty grammes of hot water is dissolved one gramme of chrome alum, which is gradually added to the gelatine solution, the latter being stirred the while. The solution is filtered through fine muslin, and while yet warm the glass plate is coated with it, the gelatine being poured on like collodion, and spread with the aid of a glass rod. The drying takes place in a locality free from dust. The preparation of the plates with gelatine may be undertaken some time previously, the same being kept in a box with their backs properly marked. Before development the dry gelatine plate is dipped into cold water, and after a minute the exposed tissue is pressed against it. After passing over the squeegee, the tissue is weighted, allowed to remain five or ten minutes, and is then developed.

When impressions of the greatest sharpness and delicacy are required, Monckhoven's plan should be adopted. The main thing is to impart to the tissue a mirror-like surface. A carefully cleaned piece of patent plate, somewhat bigger than the bit of tissue to be sensitized, is coated with very clear normal collodion, and dried for some hours in a dust-sheltered spot. The plate is neither waxed nor put into water.

The tissue is put into the bichromate bath, and then its gelatine surface placed upon the plate, squeegeeing as usual. The tissue is permitted to dry upon the plate. It will remain perfectly good for a week in this way, adhering to the glass. If several such plates are at hand they are placed one over another, so that the air cannot act upon the back of the tissue. Bubbles must be avoided as much as possible, for as soon as the tissue is laid it cannot be lifted without detriment to the collodion film. In an average temperature the tissue dries in three or four hours. As much of the tissue is cut off as is necessary, and this is then found to have a mirror-like surface, which lies in close contact with the negative in printing. The printing is done in the ordinary manner, and before development the tissue is put into water soured with hydrochloric acid (about one to one thousand). The tissue must remain in here longer than usual, so that the gelatine is thoroughly impregnated with water, otherwise reticulation will set in. The tissue is placed upon a faultless glass plate, without collodion or wax, and squeegeed in the usual manner, air-bubbles being especially avoided. If the tissue does not adhere well to the plate, a weight is put upon it; in half an hour the tissue will lie perfectly flat. Before this, the development must not take place.

It is begun with luke-warm water (23° C.), and afterwards warm water is made use of. If the collodion separates on development, then it is necessary to wait some hours before proceeding with the operation; or the plate must be previously coated with collodion, gelatine, or a thin solution of gutta-percha in chloroform. This coating must be quite dry; the tissue will adhere to it then very firmly.

The diapositive sometimes requires to be intensified; in the case of gelatine plates, however, no intensifier can be

used, as the substratum then gets discoloured. In other cases, or when collodion has been used, the intensifier may be employed with advantage. Two solutions are necessary:—

a.—	Permanganate of potash	...	10	grammes
	Water	...	500	"
b.—	Sugar...	...	5	"
	Ammonia	...	2	"
	Water	...	500	"

Equal parts of a and b are mixed in a dish, and the dispositive put in. Its colour changes to a yellow; and the process must not be carried too far. When dry and laid upon white paper, the result should appear somewhat darker than a good paper print.

IODISING COLLODION WITH ANILINE SALTS.

BY DR. EDER AND CAPTAIN TOTHE.*

THE idea of employing organic iodides and bromides for mixing with collodion is already an old one. The best suggestion made in this direction was that of Van Monckhoven, who recommended the use of iodide and bromide of ethylamine; and the observation which was made to the effect that iodide of ammonium with alcohol forms, after a long time, iodide of ethylamine, and that before a collodion prepared with the latter would have the properties of a ripened product, supported this recommendation of Monckhoven. The production of iodide of ethylamine is, however, a very difficult matter, and, practically, the employment of the compound for iodising collodion is inadmissible.

But the interesting result showing that the alcoholamines of the fatty acid series yield iodising salts has induced us to undertake a series of experiments with the amines of the benzole series. We chose aniline, the prototype of the series, as the starting point of our research; it possesses, but in a much less degree than its salts, the property of absorbing iodine and bromine.

Hydro-iodate and bromo-iodate of aniline were produced by taking nitrate of aniline three parts, and dissolving it with as little water as possible, with iodide of potassium three parts, or bromide of potassium two parts, the solution being afterwards treated with alcohol; the filtrate from the crystalline precipitate (saltpetre) yields, after vaporising on the water bath, slightly coloured, needle-shaped crystals of aniline salts. With this we prepared two descriptions of collodion:—

1. One simply iodised by mixing a solution of 4.0 grammes of hydro-iodate of aniline in 50 grammes of alcohol with a threefold volume of a two per cent. normal collodion.

2. One bromo-iodised by means of a solution of 8.4 grammes of hydro-iodate and 0.5 gramme of hydro-bromate of aniline in 50 grammes alcohol.

The collodions became coloured immediately after mixing, and assumed a strong golden yellow colour; they had the same iodide and bromide contents as an ordinary negative collodion.

Both, we found, gave equally unsatisfactory results. Sensitized in a ten per cent. silver bath, they both gave uniform films, but thin, flat pictures. The time of exposure must be longer than in the case of ordinary collodion, although not very much so.

As might be expected from the proneness to decomposition of aniline compounds, the aniline collodions were both of them rapidly decomposed, and in the course of two or three weeks had assumed a deep red colour.

We take the liberty of communicating these unsuccessful results of our investigation, as they serve to complete our systematic knowledge of the iodising of collodions.

* Read before the Vienna Photographic Society.

COLLODIO-ALBUMEN AND OTHER DRY PROCESSES.

BY GEORGE W. HEWITT.*

DURING the last few years I have tried almost every dry process that has appeared from time to time in the journals, as the multitude of bottles, compared with the paucity of good negatives, in my possession will attest. I have been in search of the "philosopher's stone" of dry-plate photography—a process that would do everything better than "wet," and be no trouble in the bargain. My course, apparently straight ahead to this result, has really been in a circle, and has brought me to the point from which I started some five years back. In the time above mentioned I have had recourse for my preservatives to the henroast, the kitchen, the brewery, and the apothecary. I began with albumen, from that to tea and coffee, thence to beer and porter, and finally squills and nux vomica. I gave these all a trial, as well as raspberries and serum of milk. During this siege with bath process I also had on hand series of experiments with emulsions, both washed and unwashed, generally with an excess of something in them always ripening, but seldom ripe. They gave me no end of trouble, and, when failures occurred, it was a great satisfaction to be able to lay the blame on the cotton, the unsuitability of which is one of the strong points of the emulsion process, and will cover a great amount of chemical blundering. Gelatin, the most seductive of all, did well for a time, but eventually brought me into red fog and blisters. The moist process I did not attempt, but for the purpose I conceived a modification of the hot-water process, as follows:—Add a little of the decoction of mustard-seed (lately advocated) to the hot water in which the plate is immersed, dry off, and give it a dose of syrup of squilla, laudanum, and nux vomica, which will produce a profuse perspiration, and keep the plate moist for a considerable interval. I have not tried this, but have seen the day when I would have done so. After all my experience in trying published formulae in this and other branches of photography, often as conflicting as they are numerous, has led me to the conclusion that it would be better and appropriate if the heading to some of our photographic periodicals of the day was the opening address of King Powhatan to his congress of Indians, viz.: "All those laws we made yesterday, we hereby now repeal."

The following I offer simply as the result of all this experimenting, as far as my own experience is concerned. The most desirable quality in a dry plate is the certainty and uniformity of result, irrespective of its rapidity. It should admit of considerable latitude in exposure, have good keeping qualities both before and after exposure. An adhering film that would pass through all the necessary manipulation without slipping or blistering, should be free from defects in the film, from blurring and solarization, and should not require backing. The quality of the finished negative is the standard that should guide in the selection of a process, and not the rapidity of the plate, or the simplicity of its preparation. The object of photography is to produce a representation on suitable material of a subject selected. Chemical manipulation is essential to the attainment of this end, but we must bear in mind that it is this representation in pictorial form that we require, and not an ingenious or simple solution of a problem in chemistry. Photography opens up a vast field for experimental chemistry, and it is a very interesting one, and also very necessary for the advancement of the art; at the same time, if the means are at hand to accomplish what we require as artists, we may leave the experimental part of it to those who have the time and the inclination to follow it. A process having the qualities above described has been before the photographic community for the last twenty years, but has been lost sight of by many in the present conditions of chemical complications. It is a slow process; in fact, with me all dry plates

* Read before the Photographic Society of Philadelphia.

are slow. The most rapid plates I have ever made are the gum-gallic plates, with a highly bromized collodion and strong nitrate bath. On a well-lighted and open view these plates, when freshly made, will work quite as rapidly as wet plates; but this comparison ceases when the plates are a few weeks old, and the subject has heavy masses of foliage in shadow, or, in fact, the usual landscape effects. I have invariably found in this case that it required at least ten minutes wet exposure to bring up all the detail. I have noticed this quality in dry plates, that, while responding quickly to the well-lighted parts of a subject, the film is not impressed in a corresponding degree by the weaker vibrations of light; and, consequently, in exposing for the shadows, the high lights always receive more time than they really require, and it is on this point the generality of dry plates break down, the lights becoming thin and solarized, losing their detail.

With the very rapid emulsion plates I have had little experience, but that has taught me that chances of failure increase in direct ratio with the sensitiveness of the plates, as well as blurring, defects in the film, and difficulty in timing and development. I know that rapid emulsion plates can be made to work as quickly as wet, and do it well. There is no doubt on this point. But I am speaking now from my own experience, and I have never met with any emulsion process that equalled in its results the original one of M. Carey Lea, as published by him in 1870. I do not think any improvement has been made of this process, even by himself. As to the reliability of rapid emulsion plates, some years ago, while photographing on the Wisconsin, using gum-gallic plates, and giving from three to six minutes, I met a gentleman taking an outing for the same purpose. He informed me he was working emulsion, and giving from four to six seconds' exposure. I afterwards saw the negatives he made on that occasion, and they were excellent and fully timed. Some time after I met him again with his camera, but this time his object was to make negatives of an open-air group of the members of a society out of town. I remarked, that with those rapid plates of his he would have no difficulty; but he astonished me by replying that, as it would be the only chance he would get at the party, and as they were very anxious to have the pictures made, he had left his rapid plates at home, but instead had a few slow plates that he felt sure of. I judged, from what he said, that when he went out for the fun of the thing, he took the rapid plates; his slower ones when he meant business. This gentleman is one of the most successful workers in emulsion in the city, and his experience seemed to coincide with my own, that, for reliability and perfection of result, a slow process will necessarily be the choice.

The negatives that I have brought for your inspection this evening were produced by a process of this character, the details of which I will now describe. The only novelty that I claim for it is that there is nothing new in it.

The plates are albumenized with Ackland's albumen 1 part, water 25 parts, which I keep in this proportion in a comparatively large quantity, and filter off as much as I may require. If anything, it improves with age. The nitrate bath, 40 to 45 grains to the ounce, with 5 drops of glacial acetic acid to each ounce. The collodion: any good commercial sample will answer, but my best results have been made with the following, an English formula, the best collodion for any purpose I have ever tried:—

Anthony's snowy cotton...	...	6 grains
Ether, concentrated	...	4 drachms
Alcohol (78°)	...	2½ "
Add to this 1½ drachms of the following:—		
Alcohol	...	6 ounces
Iodide of cadmium	...	112 grains
Bromide of cadmium	...	40 "
Chloride of cadmium	...	16 "
Iodide of ammonium	...	80 "
Bromide of ammonium	...	20 "
Iodine	...	4 "

The preservative: Ackland's albumen 1 part, distilled water 4 parts. A solution of gallic acid in alcohol, in the proportion of 60 grains to the ounce, filtered. These are all the chemicals required, and they can all be kept in stock.

(To be continued.)

Correspondence.

CHEMICAL INSTRUCTION FOR PHOTOGRAPHERS.

DEAR SIR,—Reading a short time back an article in the *News* entitled "Ought Photographers to Understand Chemistry?" and your appropriate observations, brought to my mind the idea of examinations and certificates for aspirants intending to follow the photographic profession.

Some years ago I was the first to bring this subject before the notice of your readers, and think with the aid of the Photographic Society it could be well carried out. If we look around we find that such examinations and certificates are required by Government and by nearly all professions. Why, may I ask, should our beautiful art be degraded by the want of systematic education of its professors?

As an example of the benefit of such a course, I may point to a class of shop-keepers entitled chemists and druggists. In my younger days very few indeed had the slightest claim to the title of chemist, and the whole body were little more than what might be considered medical grocers, better termed druggists. The institution of the Pharmaceutical Society, and the late Act of Parliament concerning the sale of poisons, has entirely taken the profession out of the hands of ignorant pretenders, and it now stands second only to that of the medical man himself. Though they seldom have time for research, some few persevere, and become analytical chemists. Of these bright stars I am not speaking. With pharmacy and therapeutics, photographers have nothing to do; yet their chemical knowledge should be of a far more practical character than is required by the before-mentioned class, and it should be directed towards those objects which their art renders necessary. There are so many scientific operations nearly every day becoming necessary through the advancement of photography, that it is difficult to say where the student's knowledge of chemistry should cease, or in what direction his researches would be best directed. But if I might venture to recommend, I should say let him acquire a sound knowledge of the general outlines of the science, and then direct his attention more particularly to metallurgy, the metallic and other salts, chemical re-action and decomposition, and the gases.

With your leave, in a future paper, I will try and sketch a systematic and general outline of what a photographic student's education should consist; not with any intention of being dogmatic, but with the hope that the matter may be taken up and commented on by wiser heads than mine. There is no knowing, when a seed is planted, what a flourishing, fruitful tree it may become.—I am, dear sir, yours truly,

JAMES MARTIN.

5, Clarence Place, Alfreton, May 29th.

IMAGE ON THE EYE OF A DEAD BODY.

SIR,—Dr. Vogel's wonderful account of the photographic properties of the retina of the eye is most interesting, not from a photographic point of view only, but also in many other regards.

One great benefit which suggests itself as a practical corollary of this discovery, when it shall have been further developed, is its possible application to the identification and detection of murderers. In many instances, no doubt, the image of the assassin must be the last one that appeals to the fading vision of the victim. In such cases it might

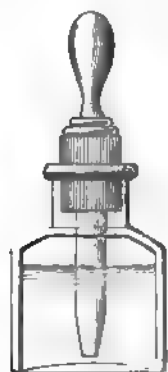
prove of great service to the police if the eyes of the corpse were withdrawn from the head, and treated in such a manner as to secure the image last imprinted on the retina. Glass counterfeits might be substituted in their stead, if desirable, for the identification of the body.

It is not, of course, implied that entire reliance should be placed upon any such means, for it is, indeed, evident that suspicion might often be cast upon innocent persons; but merely to hint a possible addition to the means of discovering and bringing to justice the perpetrators of crime.—I am, sir, your obedient servant, H. WILSON.

[The notion that an image of the murderer might be found imprinted on the retina of his victim has often been discussed, and generally dismissed as improbable by scientific men, as until the recent discovery to which you refer there was no evidence that vision was a photographic process. Even in view of the late experiments, it is very doubtful, we think, whether any practical application can be made of the facts in the way of identification.—ED.]

A SIMPLE AND EFFICIENT DROPPING BOTTLE.

SIR,—I beg to enclose the sketch of a very simple dropping bottle, which will, I do not doubt, find favour with those engaged in dry plate work necessitating alkaline development. The dropping bottles in ordinary use have several faults: the cap of india-rubber, if not used for a short time, gets hard, and leaks; the stoppers have to be removed while travelling, and they are by no means cheap. The simple one shown in the drawing,



which was suggested to me by a friend, answers admirably in every respect. As will be seen, it is composed of a baby's teat, a square bottle (most convenient for packing), a piece of glass tube, and a cork. In travelling, the solutions may be kept in their place, there being no necessity for removing the cork, as the liquid will not run into the teat. Large letters cut out of paper, A B V S, can be pasted on the broad side of the bottle, or could easily be etched in by fluoric acid. The teats being composed of a superior sort of rubber, will last a considerable time, and could, in case of accident, be easily renewed for a trifling sum.

WALTER W. B. WOODBURY.

[A somewhat similar dropping bottle was recently described by one of our correspondents. All who have tried ordinary india-rubber will at once appreciate the advantage of using the teats mentioned by Mr. Woodbury.—ED.]

Proceedings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.
The ordinary meeting of the above Society was held at the Odd Fellows' Hall, Bradford, on Monday evening, the 7th inst., the President in the chair.

The minutes of previous meeting having been confirmed, two new members were elected.

The SECRETARY then read a communication from the Glasgow Society, regarding the Autotype patents, when it was decided, on the motion of Mr. Crosthwaite, to adjourn the matter until the October meeting.

Mr. JOHN SMITH then read a paper entitled "Stray Thoughts on Carbon Printing," and exhibited several pieces of apparatus designed to promote pigment printing; viz., a mechanical sensitizing dish, with a pair of rollers carrying an endless band on which the tissue was fastened (the rollers turned the tissue thus immersed); an ingenious clip for drying tissue; a drying box; and a frame for preventing the mounted picture from springing from the glass in drying, at the same time leaving the back of the card exposed, to facilitate the evaporation of the moisture.

Mr. GREAVES exhibited, in conjunction with Mr. SMITH, one of his new patent printing and tinting frames for chromotype work; also a case of small vignettes in carbon, produced by his new method, which were considered by those present as almost perfection. The negatives were fine specimens of delicate manipulation, while the gradation of tint in the vignetting could not be surpassed. The various pieces of apparatus were inspected with great interest by the members, most of whom are much interested in permanent printing, Messrs. Smith and Greaves being frequently called upon to answer some question regarding the apparatus.

Mr. SACHS considered the machine for tissue sensitizing unsatisfactory. He certainly thought the use of gloves would prevent the deleterious action of the bichromate on the system, and this appeared to be the only advantage claimed for the machine. There was, he thought, a great probability of the tissue in its immersion carrying with it numerous air-bubbles, which would require removing. Taking all things into consideration, he was of opinion that hand-sensitizing was preferable. The drying-box he thought practicable, and the printing frames of Mr. Greaves simply invaluable. He had tried several frames for the purpose, but had seen none to come near Mr. Greaves' for economy of time and excellence of construction. In his own establishment he used Lambert's, and thought they were superior to Higginson's, but Mr. Greaves' was far better than Lambert's. A great advantage was gained by manipulating nine at once. As to the vignettes, he could not praise them too much, as he had personally inspected the method, which was so simple that any boy could print them. As to the method of producing combination negatives in the camera, the great drawbacks were that the least inequality in the negative would prevent an even tint being printed round the margin, and the most scrupulous cleanliness was necessary, as a slight defect, which would never be noticed in a plain picture, would prove fatal to the marginal tint.

Mr. SMITH replied that he did not advocate the use of any such method commercially, but it was a ready mode for amateurs not desiring to go to the expense of registering frames.

Mr. CROSTHWAITE remarked that Mr. Smith's paper taught some very useful lessons; though not an exhaustive epitome of methods and formulae, it showed plainly that equally good work might be produced by persons working very diversely, both in methods of manipulation and formulae. It served to demonstrate, most unequivocally, that if an experimenter failed to produce satisfactory work, it was very probable that the principal fault lay with himself, and not the material. It had been very much the fashion of late to decry the material supplied, and desire a change; but there was such a thing as falling out of the frying pan into the fire. A good article, uniform in manufacture, was what was wanted, and he was afraid it would not be obtained by splitting up the manufacture, and having a number of tissues of varying qualities and colour in the market, which would vary as much, or more, than albumenized paper, that fruitful source of complaint. Carbon printing seemed to be very much like dry-plate work; with the same batch of plates one operator would produce clean, brilliant negatives, whilst with the same material another would get grey, foggy, worthless results; this, in most cases, arose simply from a want of experience in that particular method. Just the same reasons applied to carbon printing. When an operator had become perfected in a certain process by years of experience, it was not to be expected that he would at once jump into successful practice in a totally different method. There must be a certain amount of practice and familiarity with the conditions under which he was working, otherwise success would be only occasional, and even then, more by good luck than good management. It was important, too, that the apparatus and arrangements be of the best, and most easy of manipulation;

and some of the apparatus shown that evening was of that kind, and seemed likely to be of very great service in the cause of permanent printing.

Speaking of Mr. Greaves' vignettes, Mr. JENKINS remarked that he had seen them produced, and could speak for the ease with which they were vignettised, as the specimens shown were not specially got up, but simply selected from the daily work.

Mr. SACHS said that carbon vignettes had been produced for a long time; but the tinting difficulty had never been so easily overcome until now that Mr. Greaves had perfected his method.

Mr. COOKE exhibited a tent for out-door wet-plate work, of a very compact and complete character, which was inspected with much interest by the out-door workers.

The usual votes of thanks were then awarded to Mr. Smith for his paper, Mr. Greaves for his apparatus shown, and to Mr. Cooke for the exhibition of his portable tent.

The Society then adjourned their next in-door meeting until October; but arranged for an out-door meeting and excursion on the 6th of June, to Kippenden.

The proceedings then terminated.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday next, June 7th, in the Rooms of the Society of Arts, John Street, Adelphi, a paper on the "Nitrate Silver Bath" will be read by Mr. B. J. Edwards.

GLASS FOR NEGATIVES.—We have been favoured with some samples of the glass sent out by Messrs. Shrewsbury, Howard, and Co., of Digbeth, Birmingham, under the name of "imprimatur plate." The surface is singularly good and free from blemish; and as the price is less than patent plate, it can scarcely fail to be welcome to photographers. It possesses an unusual advantage in having the most perfect surface marked with the letter S at the corner, so that the operator is left in no doubt as to which side should be coated with collodion. Their plates for microscopic objects are capital.

THE PHOTO-ARTISTS' COMPANY.—This Company, under the directorship of Mons. Piquépé, has just issued a new catalogue, which will interest photographers. It is illustrated by a capital example of retouching, and side by side with it a print from the untouched negative, which well illustrates the skill with which the retouching is effected.

PAYMENT AT THE TIME OF SITTING.—Our advertising columns contained an announcement of an inscription for the studio or specimen room, with an intimation, which must attract the attention of all, that all photographs must be paid for at the time of sitting. A specimen of the announcement forwarded to us is neat, bold, and ornamental.

To Correspondents.

G. and R. LAVIS.—The three cabinet portraits have been received and handed to our Publisher, who undertakes attention to registration for our readers. There were no stamps in your letter or parcel. The stamps, together with full particulars, as name of portrait, owner of copyright, &c., must be sent to our Publisher. Any kind of copy, whether enlarged or reduced, would constitute an infringement of copyright.

J. K.—The data you give in regard to the portrait studio required is somewhat too vague to permit of very definite advice. One of the simplest and most useful consists of an oblong glass room with span roof: about twenty-six feet long by twelve feet wide, fourteen feet at the ridge, and seven or eight feet at the eaves: both ends opaque: the side and roof, facing north, to be of glass, except about five feet at each end, the glass at the side coming to within about twenty inches of the floor: the south side and roof about half as much glass as the north side.

B. G. F.—Unsize paper should be used in making papyroxyline. Swedish filtering paper answers well; ordinary blotting-paper may be used. In our experience, pyroxyline made from paper has given a little more intensity in the negatives than that made from cotton.

T. J. P.—The most probable cause for the dirty yellow stains at the margins of the prints, which you describe, is the presence of hypo in the mounts, many samples of pasteboard having such traces, used in the manufacture. There is no remedy. Sufficient quantity of a fresh thirty-grain solution is all that need be added to your bath.

OSBORN.—There is no work, that we know of, devoted to the subject of producing photographic lantern slides. There have been many articles on the subject in the back volumes of the PHOTOGRAPHIC NEWS, and also in the YEAR-BOOK OF PHOTOGRAPHY.

T. W. MARTEN.—Our Publisher will send what you require. Regarding the carbon process, if you take any one of the series of lessons which have appeared in our pages, and follow instructions carefully, we think you will succeed. The Manual issued by the Autotype Company contains, also, very complete instructions. It you will state your difficulties at any time, we shall have pleasure in giving you, in this column, special hints thereupon. We do not know of any better mode than these of obtaining written instructions. For a dry process, we do not know of any better, or more likely to suit your purpose, than the coffee process, described in last year's volume, and also in our last YEAR-BOOK. We shall have pleasure in seeing at any time examples of your work.

R. M. H.—It does not necessarily follow that because carbon printing is progressing, and entering largely into general use, that silver printing is falling off in precisely the same ratio, as you argue. Carbon is employed to a large extent in work, such as art reproduction, which would not, without a permanent printing process, have been done at all. It is possible that silver printing may eventually pass entirely out of use; but not for very many years, and quite possibly never. It is probable that in many matters permanence may be unimportant; a temporary duration may be all that is required. You are in error in supposing that the earlier photographic processes have passed out of attention and ceased to be practised because they were not permanent. A properly produced and properly preserved Daguerreotype was quite permanent, and many are now in existence as good as they were when first produced. A print produced by the calotype process is generally found to be more permanent than an albumenized print. If a print is properly fixed and washed, the process of enamelling tends to secure its permanency.

D. L.—A collodion positive on glass, backed with maroon velvet, is generally brighter and less heavy looking than a ferrotype. The direct contact of the image with the dark surface of the latter produces a heavier effect than the velvet backing of the image on a plate of glass. The non-inverted coloured glass positives to which you refer were collodion positives, treated with a whitening solution which contained salts of mercury. The powder colours were applied, with as much force as possible, to this whitened surface, and this was then treated with a thick spirit varnish, specially prepared for the work. The application of this varnish carried in the colour into the porous film, so that it was seen vividly from the reverse side of the picture, which viewed from that side was, of course non-inverted. Much pains and skill were required to produce successful results; but when well done, the pictures were very fine, and had all the appearance of very delicate miniatures in oil. We do not know of any one who produces such pictures at present. The materials were sold by Newman, of Soho Square.

E. H. DERRAM (Boston).—The sample of tissue received. We will try it, and report.

J. H. CORSCADEN.—Many thanks. In our next.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. E. ASHTON, St. Ives,

Three Photographs of Mr. Philip Phillips.

Messrs. W. and D. DOWNY, Ebury Street, Eaton Square,

Photograph—View of the Colosseum, Rome.

Photograph—View of the "Leaning Tower," Pisa.

Photograph—View of the Doge's Palace, Venice.

Mr. J. PHARMAN, Redditch,

Photograph of St. George's Church, Redditch.

R. BROWNETH, Cheltenham,

Photograph of Mr. J. B. Dodd.

Mr. C. J. DORSE, Middlesboro',

Photograph of Major Beaumont.

Mr. J. BURGOYNE, Coventry Road, Birmingham,

Four Photographs of Miss M. Faringham.

Mr. P. JENNINGS, Dublin,

Photograph of Old Mill, Ambleside.

Photograph of Stybarrow Craig, Ullswater.

Photograph of View of Conistone Lake.

Messrs. E. DAY and SON, Fournemouth,

Three Photographs of Lord Cairns.

Two Photographs of Rev. Canon Cairns.

Mr. H. V. HARMAN, Bromley,

Photograph of Little Grey's Farm, Cudham.

Photograph of "The Woodlands," Cudham.

The Photographic News, June 8, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE MEDAL FEVER, AND FORTHCOMING EXHIBITIONS—PHOTOGRAPHERS' ASSISTANTS AND THEIR DUTIES.

The Medal Fever, and Forthcoming Exhibitions.—Photographers cannot complain just now of want of encouragement. Throughout Europe a prolific shower of medals may shortly be expected, and it will be hard indeed if any one who strives for favours should not be successful in catching some of the drops that are to besprinkle the photographic pastures. Amsterdam promises medals, Vienna promises medals, Paris promises medals, and even the Photographic Society of London announces a distribution of similar favours. It will be quite worth while "doing a picture," for a lucky candidate may even hope to carry off three or four awards with the same productions. All the societies seem to be striving to out-bid one another in the hope of securing competitors in the race, for whether it is pictures or processes that are wanted, the same inducements are held out. We do not propose to enter into any discussion as to the advantages or disadvantages involved in the award of medals, and only hope that the anticipations made by the several bodies will be fully realised. One thing, however, connected with the promising of medals for the fulfilment of certain problems always has a disappointing effect upon our mind: the result is invariably so disproportionate to the loud trumpeting and fuss with which the conditions are made known. It may be for a dry process that the prize is offered. What is wanted, we have been informed over and over again, is a dry collodion process which shall be as good as wet, as certain in its action, and as simple in its nature; it is to yield prints beyond reproach, and, if possible, be upon a basis as transparent and convenient as glass, and yet tough and flexible; in a word, perfection is asked for. The result, as we have said, is not perfection. In fact, the successful competitor usually brings forward a process which has neither novelty nor excellence to recommend it, and the prize is awarded not because the problem has been fulfilled, but because one hardly knows what else to do with the medal. So far as regards photographic exhibitions, we think that the main thing to be arrived at is to produce a collection of photographs which, like a collection of paintings, is worth looking at from an art point of view only. By all means let us have encouragement of the technical and scientific aspects of photography; but if the public are invited to view an exhibition of photographs, and the latter is to be made interesting and worthy of a visit, then the only aim to be kept in view is to make the collection one of pictures essentially. Again, the pictures, to our mind, should be such as can be examined without too close an inspection. Tiny prints and bijou productions are very well in their way, and should doubtless have a well-lit corner allotted to them; but if we are to make the looking at photographs a favourite pastime with those who visit galleries, we must have broader and bolder photographs altogether. It is the photographer's aim to get the public to look at his pictures, and to ensure this the public must not be inconvenienced, but rather enticed to do so. An exhibition made up of small pictures is uninteresting at first sight to photographers themselves; how much more insignificant does it appear to the public! A spectator on entering such an exhibition is disappointed, and, although on close examination he finds many beauties to admire, he never altogether gets over the first impression. It is surprising what an influence Mr. Crawshaw's prizes had upon the London exhibitors; last year's show, although it contained a good many of what may be termed loud enlargements, consisted for the most part of small work, and hence contrasted unfavourably—at any rate, on the first coup d'œil—with exhibitions that have preceded it. We

hope that those who propose "going in to win" some of the medals that are to be sown broadcast will attempt work on a larger scale than that hitherto exhibited. Photographers have, indeed, much to thank Mr. Crawshaw for already, in inducing them to leave the narrow limits within which they used to work. Carte and cabinet work was what most confined their attention to, and larger pictures were a rarity indeed. This is no longer the case, happily, and we sincerely trust photographers will go on improving their work without relapsing into their former prescribed limits. There is no lack of encouragement now, and those who believe that success and progress are attained by a lavish distribution of medals may congratulate themselves to their heart's content.

Photographers' Assistants and their Duties.—With the prospects of introducing carbon and Lichtdruck printing in the studio, there should be some change for the better in the position of photographers' assistants. It will be necessary for them to be better trained and have a wider knowledge than hitherto; but possessing these qualifications an operator could not fail to secure good wages. An assistant at the present moment, who can print well in carbon—that is, produce impressions in permanent pigments equal to those usually obtained upon albumenized paper—who is conversant with the operations of wet and dry plate photography, and can take a clean and successful negative by either method, and who is finally an adept at lithographic printing, would, we should think, be eagerly sought for. And yet there is no reason whatever why such assistants should not be forthcoming, for there must be many establishments now-a-days where all this is to be learnt. Indeed, a few years hence, it is very possible that permanent prints in carbon or in fatty ink will be the rule, and not the exception, and then the aid of assistants of this class will be a necessity. No doubt photographers will have to be pressed into the service, failing assistants trained in lithographic work, but the former know nothing of photographic operations, and consequently would only be applied to in the event of none other being available. For these reasons we cannot help thinking that the prospects of the photographer's assistant are brightening considerably, and if he would only spend his spare time in learning something of the rudiments of chemistry, and especially of that part of the science which relates particularly to photographic reactions, he would raise his own status and that of photography at the same time. Many assistants complain of their scanty income who really are not so hardly used after all, since what they know could be acquired by any ordinary individual by three or six months' attention to work. The assistant who, as an intelligent and educated lad, enters a good studio, should, after a few years, be able to command a good salary. But he must know what is amiss with his bath when it goes wrong, how to prevent his albumenized paper from blistering, and be capable of printing a good vignette either in silver or carbon. If he can do this, and, moreover, produce a good photo-lithograph, and "pull" a Lichtdruck from gelatine without injury to the latter, he will be in a position to choose his own principal, if he has not the wherewithal to go into business for himself. A scientific man is not wanted, and indeed it is a well known fact that learned chemists are not the cleverest manipulators when they have to do with collodion plates and silver baths. Still some knowledge of chemistry is a necessity, if it only teach one to work economically, and to save the waste products. Working with such precious metals as gold and silver, it behoves one to be particularly careful of waste, and even the bichromate from carbon tissue, we were told the other day, is worth saving. Looking closely after the development drainings will, in a large establishment, result in a material addition to profits, and an economical use of paper after it has been sensitized will also make an appreciable difference in expenditure. In the case of large

printing establishments, where large pictures have to be produced for eightpence or tenpence a piece, it is, in fact, only by the exercise of rigid economy that any profit at all can be secured. Now, therefore, more than ever, it behoves assistants who desire to advance their position to study photographic manipulations from an economical aspect.

FRENCH CORRESPONDENCE.

TWO MORE COMPETITIONS AT PARIS—A NEW LENS BY VOIGTLANDER—M. ANDRA ON DRY PLATE PROCESSES—THE KEEPING QUALITIES OF CHARDON'S PLATES—PHOTOGRAPHS FROM STOCKHOLM—THE MONUMENT TO NICEPHORE NIEPCE—VISIT OF THE EMPEROR OF BRAZIL TO M. JANSSEN'S OBSERVATORY.

The French Photographic Society held its monthly meeting on Friday last, the 1st June. The president made known the programme of two new competitions which have been arranged by the Society. The first is of an international character, for a simple and practical medium to replace glass in negatives by some light and transportable tissue or pellicle. This latter is to be of such a nature as not to interfere in any way with the photographic processes in general use, whether dry or wet. The second competition is organised for the purpose of developing a means of reducing to a minimum the impediments of landscape photography, the prize being given for the simplest equipment for out-door photography. Only French photographers and makers of apparatus will be admitted to the latter competition, which will be closed, like the former one, on the 1st of January, 1878.

M. Carette exhibited to the members of the Society a new lens, constructed by M. Voigtlander et fils, to which the inventors have given the name of Euryscope. The construction of this lens is based upon the calculations of Dr. Sommer, Professor of Mathematics and Director of the Polytechnic School at Brunswick. It is composed of two achromatic symmetric glasses, in the centre of which is placed a diaphragm. The instrument is perfectly aplanatic, and, therefore, it is possible to work with a full aperture. Although for the most part designed for landscape work, it may be employed for taking reproductions, interiors, monuments, groups in the studio, &c. The authors affirm that the instrument gives straight lines, images without distortion, and that, moreover, the defect known as flare is altogether unknown. M. Carette remarked, at the same time, that a certain degree of curve being inevitable, if sharpness is desired to the very edge of the picture, this can be secured by the employment of a more or less small diaphragm. But what most of all distinguishes the instrument, said this gentleman, was its great luminous power, enabling one to secure groups in the studio in a much shorter time than usual. The instrument may be made, too, to embrace a very wide angle (from 65° to 80°), according to the nature of the diaphragm employed. At the request of M. Carette, a commission was nominated to experiment practically with the new lens.

A skilful amateur, M. Andra by name, who has made a series of experiments with the products and formulæ recommended by M. Chardon (to whom the prize for a dry plate process was recently awarded) has made known that he has in general secured satisfactory results with the same, especially when he augmented materially the time of exposure. Another operator, M. Magny, writes that having exhausted, when travelling, his stock of Taupenot plates, which he was in the habit of employing, he prepared a number of films after the manner of M. Chardon; with these he secured some very successful results, giving only half the exposure which he was accustomed to devote upon collodio-albumen plates. Finally, the jury which made the award gave some account of the keeping qualities of the plates as exemplified by those remaining in their hands ever since December, 1876. These films gave good results except that the margins were somewhat defective, a circumstance due, according to M. Davanne,

to the surrounding atmosphere, which has penetrated into the box in which these plates were confined.

M. Jaeger forwarded to the Society a magnificent collection of silver prints of various kinds, including portraits, landscapes, historical paintings, marine views, &c., all taken from the Stockholm Museum. M. Quinsac, of Toulouse, also sent some views printed in greasy ink, which had all the exquisite delicacy and brilliancy of the finest impressions produced by silver printing. These pictures, printed upon paper slightly varnished, were vastly admired.

I have spoken in one of my preceding letters of the decision of the Municipal Council of Chalons-sur-Saone, in respect to the erection of a statue to the memory of Niepce and Niepce, and their resolution to spend five thousand francs upon the monument. I have now received further details in respect to the project. M. Landa, the director of the *Progres de Saone et Loire*, and one of the Municipal Council of Chalons, in forwarding me the report on the subject, tells me that it is progressing favourably. The Executive Commission nominated by the Council is about to commence operations, and will place themselves in communication with persons who may be considered likely to further the work by means of subscription or otherwise. M. Landa, who has interested himself heart and soul in the matter, is a conscientious and zealous writer, and has represented very forcibly that the oblivion into which Niepce's name has fallen among his compatriots is anything but honourable to the nation. In England, where public recognition for services is so broad and complete towards great and useful men, people will be pained to hear that the widow of Niepce died in the hospital of Chalons, and that in the cemetery of St. Loup de Varennes, where the pair are buried, there is to-day not even a cross to mark their resting-place, which is at the present moment hidden by nettles and brambles. Let us hope that this deplorable state of things will soon be remedied.

On Saturday last the Emperor of Brazil visited the astronomical and physical observatory which M. Janssen has organized upon the terrace of the *Chateau de Meudon*, and of the establishment of which I spoke in a former letter. I had the honour of being present, and I can well bear witness to the interest taken by the august traveller in the solar images which are daily secured at the observatory, and in the magnificent instruments with which the photographs are taken. The closing arrangement, which permits one to regulate the exposure from a fiftieth to a twelfth of a second, according to circumstances, and the clock-work arrangement in connection with the heliostat, which allows the sensitive plates to remain automatically in their proper position, captivated the attention of the "Royal Corresponding Member of the Academy of Sciences," as well as the ease with which M. Janssen transformed the gigantic astronomical instruments into a photographic apparatus. My readers may know that the solar images taken at the Observatory at Meudon are not less than forty-five centimetres in diameter. They are secured upon dry plates prepared with tannin, and developed by the aid of sulphate of iron. The plates require, as we have just said, an exposure of a fraction of a second only. The visit of the Emperor of Brazil was protracted to two hours and a half, and, before leaving, he expressed to M. Janssen great satisfaction at having seen the laboratories and observatory of the eminent astronomer. Don Pedro, who starts on the 9th for Great Britain, will be in London in a few days.

ERNEST LACAN.

THE PLATINOTYPE.

BY W. E. BATHO.

THE number of processes for producing permanent photographs afford sufficient variety to suit every taste, and to meet most demands. This is one of those methods for realizing the desideratum of a permanent photograph which, while being a most elegant adaptation of the laws of chemical affinity, seems not to attract the interest it deserves.

The platinotype process of Mr. W. Willis has been set forth as a process giving a result of special value in certain departments of our art, and most decidedly the results are unique. The artist can have a photograph on any special paper with the tooth left intact for his brush work, the shades consisting of a deposit of platinum black, a substance in itself as stable as any we possess.

It is more than likely that photographers will look with some amount of suspicion on the claims made in behalf of the platinotype for permanency, when it is observed that nitrate of silver and hyposulphite of soda are generally employed in the process. Yet with equal justice might the carbon process be decried, seeing that it is possible to use fugitive colours in the making of tissue. Wherein the fading of a silver print consists a cautious chemist would hesitate in positively affirming. The usual method of picking up the symbols at random, and showing therefrom a decomposition of some sort, serves not to make matters clear. It has yet to be shown that because hypo and silver are used in the platinotype, it must needs fade.

The reactions involved in the process under discussion are very beautiful, and cannot fail to arouse more than passing interest, and is a capital example between an haphazard invention and one evidently the result of patient thought.

The rationale of the process is as follows:—*Ferrous-oxalate*, while being a good reducer of such metals as platinum, iridium, or gold, is insoluble in water, and hence there is at first some difficulty in bringing them into such a state as favour decomposition. However, a solution of the neutral oxalate of potassium is a ready solvent of the ferrous-salt, making an excellent "developer" when the salts of platinum, &c., are brought in contact therewith. *Ferric-oxalate* is readily soluble in water; it also is reduced by the action of light to the insoluble *ferrous-oxalate*, so if paper be coated with *ferric-oxalate* solution, and exposed to the light, those impressed portions will have the *ferric-salt* reduced to the *ferrous* in proportion to the light action, and be in the condition for reducing platinum or other metals upon such portions, to form a picture.

Such are the reactions involved in the platinotype. Its practice is as follows:—A starch-sized paper is floated on a six or eight-grain nitrate of silver solution. Floating is not necessary. A little of the silver solution poured on the sheet of paper, and spread with a pad of cotton-wool, I have found equally efficacious. This is allowed to dry thoroughly—indeed quite dry—before a fire, as I find this proceeding keeps the print on the surface. The silvered sheet is now placed on a plate of glass, and clipped thereto with American clips. A small quantity of a mixed solution of chloro-platinite of potassium and ferric oxalate is poured on the sheet, and spread with a pad of cotton wool, and subsequently levelled with a squeegee made of flannel wrapped round a glass rod; the sheet is now dried in the dark, and is ready for printing; it has a pale primrose colour in daylight, but rapidly darkens, being much more sensitive than silver paper. It need scarcely be added, the foregoing operations must be performed in the dark room. The printing is accomplished in the usual manner. Experience will teach when the picture is exposed sufficiently, by an inspection of the print, a faint outline only being seen. The impressed paper is taken out of the printing-frame, and floated on a hot solution of potassic oxalate, when the picture flashes out instantaneously; it is now washed in a weak solution of oxalic acid, to remove the iron salts still in the paper, then washed in water, and toned in a sulpho-cyanide bath; again washed, and fixed in a strong hypo. solution, a slight washing finishing the operations.

The permanency of the picture is assured by the entire absence of silver in the finished result. I have not, by any test I am acquainted with, found the presence of the merest trace of silver left in the paper. I believe the patentee guarantees this, yet, with all, there will be a lurking doubt in the minds of most photographers i

any method of printing wherein silver and hypo. are brought into practice. This, however, must not be allowed to tell too strongly against the platinotype method of printing, seeing that other solvents for the silver compounds can be employed, and are named by the patentee. Ammonia forms one of these, it taking the place of hypo. This I do know, that there are silver pictures fixed with ammonia which, in the course of years, have not shown the least symptom of fading. Hence it may be safely predicted that a platinotype print, when rightly produced, will have as long an existence as a print made by any other method extant. This is but my opinion, after all, and I may add, in the words of the Koran, "Wherefore let him who will, believe; and let him who will, be incredulous."

STRAY THOUGHTS ON CARBON PRINTING.

BY JOHN SMITH.*

In bringing before you this evening a few stray thoughts on carbon, or pigment printing, I may say, at the outset, that I do not bring them in the expectation that they will carry with them the weight and importance they otherwise would supposing they were uttered by a more able and experienced person in our art-science; but I simply place them before you as the result of my own thought, reading, and observation upon the subject.

In relation to the birth, rise, and progress of pigment printing, it is not my purpose this evening to say anything, except that, like numerous other very important inventions, it has had many struggles for existence during its career from the cradle to its present state of maturity.

Upon the nature of the chemical changes which take place I need not dwell, as these have often been explained in the journals and other publications, and formulæ, manipulations, and practical details frequently given. But there are points upon which there seems to be a considerable difference of opinion and practice. A few of these I will mention.

1. *The Tissue*.—Some affirm that it is not always of uniformly good quality, and, therefore, they cannot get uniformly good results; others say the fault is not in the tissue but in the operator, the tissue being always good and reliable. Again, the Autotype Company claim to have the sole right to make and sell the pigmented paper, while some persons affirm that anyone has a right to make it for himself. Some say that the tissue sold by the Autotype Company to licencees and to those who have no license is all alike, but the Company deny the charge. These matters of difference, I presume, we shall not be able to settle here to-night, but shall have to leave them for settlement by actual experiment or by some legal tribunal, as the case may be.

2. *The Sensitizing Bath*.—Upon the strength or percentage of bichromate salt to be used various opinions are held. To take a few: Mr. John Milner (see *British Journal Almanac*, 1877, p. 73), after stating some of his difficulties, says:—"The result was the adoption of a one and a-quarter per cent. bath for all carbon work, large or small—prints up to twenty by sixteen leaving nothing to be desired so far as the strength of sensitizer was concerned." The Autotype Company give strengths of five, four, and three and a-half per cent., while some others give as high as seven per cent. As to the composition of the bath: some advise the use of bichromate of potash simply; others, the same with a few drops of liquid ammonia added until a pale yellow colour is produced. Some advise a mixture of the two salts, bichromate of potash and ammonia. Mr. R. Jastrzembaki gives.

Bichromate of potash ..	...	...	4 parts
Carbonate of soda ..	...	...	1 part
Water ..	...	...	100 parts

One class recommend the addition of alcohol to the bath,

* Read before the West Riding of Yorkshire Photographic Society.

M. Charente going as far as forty per cent. Another class of persons say that, after sensitizing, the tissue should be passed into a bath of alcohol.

Again; if we advance a step further we meet with the same difference of opinion with respect to the time of immersion. Some operators have advised a very short immersion—only six seconds—while some others advise as much as three minutes. Some draw the tissue out of the bath over a glass rod in order to take away part of the bichromate solution; others advise that it should be placed, face down, on glass, and take away the excess by the use of the squeegee, then strip off from the glass, and suspend to dry; while some prefer drying on the glass, and claim the double advantage of smoothness of surface to lay on the negative, and better keeping qualities.

As to drying, we have various methods. By one the tissue is placed with its back on a piece of blotting-paper, over a stick or rod, allowing the ends to slope from the middle. A second will hang up the tissue in an open room by means of clips—by preference near an open chimney. A third will dry in a closed box, through which a current of cold air is made to pass. A fourth will employ a gentle heat, and so on. Again: it is stated that the drying must be done slowly, and thereby obtain a greater degree of sensitiveness and freedom from reticulation. Others state that drying may be done quickly, and affirm that no reticulation is produced thereby.

I will now glance at the preparation for printing. If the object be simply to get a print from any negative in permanent colours, then the only thing requiring to be done is to put a strip of paper over the face of the negative close to the edge, to partly protect the sensitized tissue from the action of light, and print for the required time; this will vary according to the negative used. But if any particular shape, such as oval, cushion, &c., be required, then there are three ways by which the artist may obtain such results:—

1. By the method long used in silver printing—viz., masking the negative while the picture is being printed, and afterwards tinting the margin, by exposing it to light, while the printed part is covered up with a blank mask. For carrying out this method in pigment printing, specially prepared frames are required in order to get accurate registration of tint with the print. M. Lambert has a patent for frames for this purpose; Mr. G. Higginson, of Southport, advertises some special frame; and, after much thought and labour, Mr. Greaves and myself have devised what we think to be a very great improvement on both, and by the use of which much time and printing space are saved. Two of these improved frames are here for your inspection this evening.

2. This may be accomplished by placing a mask of the desired shape in the dark slide or other part of the camera, which mask is brought very near the sensitive plate; and thus the negative is taken of the proper or desired shape, leaving all the margin of clear glass. After varnishing, a mask of uniform texture, and of such a degree of opacity as will give the required tint of margin, is placed on the negative, the opening of which exactly coincides with the figure on the plate, and from such prepared negative, pictures may be printed and tinted at one operation.

3. By having two masks carried in two swing-frames within the camera—one carrying the mask for the figure, and the other the mask for the tint—a negative can be taken from which prints may be made with tinted borders at one operation. This last method is the subject of a patent, though I may say that months before the patent was taken out I named the method to Mr. Greaves, of Halifax.

The vignetting and tinting on pigment tissue has been found to be attended with very considerable difficulty, because the operator cannot see the progress of the printing. Mr. Witcombe, in an article which he contributed to the YEAR-BOOK OF PHOTOGRAPHY for this year, describes a method by which he produces vignettes.

What success has attended his labours I am not in a position to say; but I think I can say with safety that Mr. Greaves, after much patient thought and experiment, has at length succeeded in producing tinted vignettes in carbon which are perfect gems of art, and which leave nothing more to be desired.

After printing there seems to be a variety of modes of procedure in preparing the temporary support. Some wax with fluid and others with solid wax. Some use one collodion, and others a different one.

After mounting on the temporary support there is again a divergence. One artist says the prints must not be allowed to remain under pressure more than two minutes; then place in warm water—not hot—and the paper will strip off very easily. A second says the print should be under pressure for half-an-hour at least.

After development one advises the putting on of the transfer paper while still wet, while another advises drying first, and then wetting with cold water before it is put on. And so on, through every stage of the work, I might point out very wide differences in practice; but I refrain from going further, as I feel that I have already taken up too much of your time by these random remarks. Before concluding, however, I should like to give my opinion as to what I think would be good practice, especially for amateurs.

The tissue should be good in quality and of colour to suit the taste; it should be kept in a cool but dry place, and must not be allowed to become hard or brittle. It should be always as flexible as patent leather. I would sensitize in a weak bath of from one and a-half to two per cent. strength, and if acid neutralise with carbonate of soda, adding a few drops of glycerine to each pint of water. I should give a complete immersion, and for such time as would be needful to wholly saturate the tissue, thus getting more uniform sensitizing.

I should then take the tissue out of the bath, and place it, face downwards, on a glass plate previously prepared, as recommended by Mr. Milner, by giving a slight coating of Castile soap (two grains to one ounce of methylated alcohol), after the manner of waxing a plate, and let it dry on the glass. If dried quickly, and the glasses placed one upon another, so as to protect the tissue from the air, it will keep good for many weeks.

In waxing I should wax the plate by preference with solid bees'-wax, warming the plate, then make a few marks across the wax, and while still warm polish off with flannel.

I should next coat with plain, thin, tough collodion—pyroxyline two grains to the ounce of solvents—using as much alcohol as possible, to prevent the waxing from being dissolved, and thus ensure easy stripping. The transfer paper should be well softened and carefully applied. After getting about half dry, put on the cardboard (which has been previously damped) with thin glue, and dry by placing in a strong current of warm air. In a few hours the prints will strip off perfectly, and have a surface of the same character as the glass from which they are taken.

I have brought with me for your inspection and adoption, if you think there is any value in them,—

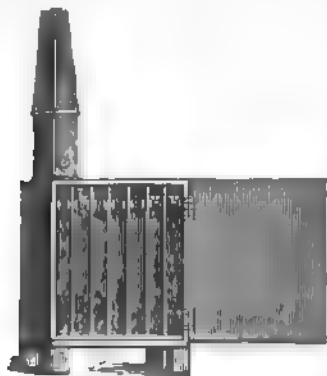
1. A model of an apparatus for sensitising the tissue. This, as you will perceive, is a box carrying a number of rollers, around which an endless web is carried. The



tissue is placed upon and attached to it, and then turned round, bringing the tissue into the bath, at the same time keeping it straight (without having to place the hands in the poisonous solution) until fully sensitised. From what we read of the damaging effects upon the health of the operator, I think some such method be used.

2. A drying-box, or chamber, divided by a number of

partitions, which are alternately short at the top and bottom, thus making, when the door is closed, a continuous passage from the inlet to the outlet; and an



induced current is made, either by burning gas within an iron chimney placed over one of the divisions of the box, from which there is an opening into the chimney, or by placing a small fan over the same opening, and worked by some mechanical power—by preference a small tubing water-wheel—by this means drawing a powerful current of cold air through the box, and thus drying the tissue in a short time. This same arrangement may be made use of to dry the newly-developed plates, and also after mounting on cardboards.

Thanking you for your patient attention to my stray thoughts, I hope that our meeting may not be altogether profitless.

ANOTHER METHOD OF WORKING THE GELATINE PROCESS.

BY H. HOULGRAVE.*

I HAVE devised the following method for working the gelatine process in the hope that it may suit the convenience of those who are not able to devote any time during the middle of the day to making emulsions. The formula with which I have been most successful is that published by Mr. J. King, namely.—

Nelson's opaque gelatine	...	40	grains
Bromide of potassium	...	40	"
Nitrate of silver	...	56½	"
Water	...	2½	ounces.

In making the emulsion, proceed as follows:—At about nine a.m., or any convenient time in the morning, weigh out, as carefully as possible, the bromide, and put it into a teacup or other similar vessel, pouring on it about one ounce of water. I then add the gelatine, cover up the cup to keep out dust, and leave it without any further care till five or six o'clock in the evening, or later if more convenient. The gelatine must now be dissolved, and the emulsion made. To effect this, place the cup, a small glass beaker (in which has been previously dissolved the silver in about six drachms of distilled water), and a suitable bottle, in a shallow tin dish half filled with cold water, and supported on a retort stand above a Bunsen's burner, which is now lighted. Having allowed about ten minutes for the materials to get thoroughly warm, pour the silver into the gelatine, stirring briskly all the time, and for about a minute longer. Then transfer the emulsion from the cup to the beaker, and thence to the bottle, rinsing out the cup and beaker with a little water, which is also added to the emulsion, and then shake up most thoroughly for two or three minutes. The emulsion must now be kept warm by any convenient means for a few hours. At about ten p.m. pour it into a flat porcelain dish seven inches by five inches, and leave it the whole of the night to set. Next morning, plunge the dish into cold water in a mug sufficiently large to contain it, cover it up from the light,

and there let it remain the whole of the day. At about six p.m. change the water, and let the emulsion remain in it an hour or two longer, then drain it for a short time; it is now ready to be dissolved and filtered previous to coating the plates.

The most convenient way of doing this is to pour a little water into the tin dish, on the top of which dish is placed that containing the emulsion (but not in the water); light the Bunsen's burner, when the hot steam which rises will very soon effect the solution of the emulsion, which should then be filtered through a bit of sponge. Then proceed at once to coat the plates in the manner so often described before.

After allowing the emulsion which remains to set in the bottle, I have been in the habit of pouring a little strong alcohol on the surface, hoping that it would thus keep indefinitely, and would be always ready for use by simply pouring off the spirit, and then remelting; but in this I have been disappointed. I find that after it has been warmed up two or three times, the gelatine seems to lose in a great measure its power of setting, the emulsion becomes very thin, and the film made with it falls up during development in a very curious manner. I am in hopes that a little fresh gelatine will remedy this defect, but have not yet had sufficient time to investigate this matter thoroughly. I will now say a few words on the prevention of blisters, which are the bane of the gelatine process.

Before proceeding to develop, flow over the plate a little common methylated alcohol; then wash off thoroughly by placing the plate in a dish and changing the water three or four times. Since adopting this simple precaution I have never seen a blister. At first I used a little pyrogallie acid dissolved in the alcohol, but now find that this addition is neither necessary nor useful.

I generally use the developer recommended by Mr. R. Kennett, but do not find any very material difference between developing a gelatine and a collodio-bromide plate. The gelatine plates, however, often lose excessively in the fixing bath, and, in consequence, require strengthening up a little subsequently. This I never attempt to do till after the negative is dry, when I re-moisten it with spirit, wash, and then apply the usual acid silver and pyrogallie solutions, with which I can get any amount of density, the difficulty being to know exactly when to stop.

There is one thing I have omitted in the proper place, and that is, in the hope of making the emulsion keep better, I have thought it desirable to increase the proportion of gelatine in the above formula from forty to fifty grains. And now, in conclusion, allow me one word of apology for the negatives shown. I beg you will not look upon them as finished productions, but as purely experimental ones—indeed, almost first attempts. Still I think they are sufficiently varied to show the capabilities of the process.

LOST ART. —We have received from Mr. B. Davison, of Odin, Ill., a small book, bearing on its cover the following title:—"Instructions for Oil Paintings on Glass, consisting of Lost Art, Crystal or Oriental, Diaphane Celestial and Italian and improved Grecian Oil Painting, by Mrs. Ann B. Davison, Practical Artist, Galesburg, Ill. Entered according to Act of Congress, &c., in the year 1869." We extract the following portions:—"Lesson 3: Lay your picture in clean water a few moments, until the paper is wet through, &c.; then varnish your glass well, &c. Then lay your picture face a de up and hold your glass varnished side down, and lay it down carefully (upon the picture) and press lightly; this will unite them." These instructions are given for pressing out air-bubbles. The work further says: "The air being all removed, leave it until well dried to the glass, &c. Then wet the picture on the back with water and rub it with your fingers until the paper is all removed but a light film, which the print retains. This you must be careful not to break. Then let it dry fifteen or twenty minutes; then varnish it again with crystal varnish. This will make it clear and transparent." It is unnecessary for us to make any comment on the above.—Ed. *Anthony's Bulletin*.

* Read before the Liverpool Amateur Photographic Association.

thread for thread. I have often had the doubtful honour of having my pictures appropriated by painters, and do not object to artists refreshing their recollection of nature by looking at my photographs, but I strongly object to wholesale copying. One of the most impudent cases of such copying occurs in the last Exhibition of the Dudley Gallery. The following correspondence on the subject may, perhaps, interest your readers.

Tunbridge Wells, May 28th.

H. P. ROBINSON.

Tunbridge Wells, February 2nd, 1877.

To the Secretary of the Dudley Gallery.

SIR,—I mentioned to you yesterday that a copy of one of my pictures was exhibited in your gallery as the work of another artist, and under a different name to that which I had given it. The number of the copy in the catalogue is 136. My picture, of which I enclose a rough copy, is copyright; and I could obtain redress under the Copyright Act; but I should prefer not to go to that extreme length, and therefore ask you to bring the facts under the notice of the Committee.

It will be seen, on comparison, that Mr. Macbeth has omitted the sky, and added some boats; the rest of the picture is identical with mine, and could not have been an accidental resemblance.

The injustice of this appropriation of my property will be more clearly seen if we reverse the position. Suppose, for instance, I obtained possession of one of the best pictures of the year, and took a photograph of it, and then sent the photograph to an exhibition, claiming the composition, light and shade, and invention as my own, and tried to sell it: what would all honest men be entitled to call me? The cases are exactly parallel.

I have also to submit that to send a copy for exhibition in the Dudley Gallery is to endeavour to impose upon the Committee, and that in this case it has succeeded.—I am, sir, yours obediently,
R. F. McNair, Esq.

H. P. ROBINSON.

February 3rd, 1877.

SIR,—I beg to acknowledge the receipt of your letter and enclosure of the 2nd inst., and, in reply, to inform you that they will be duly laid before the Committee at their next meeting.—I am, yours obediently,
H. P. ROBINSON, Esq.

R. F. McNair, Sec.

To the Treasurer of the Dudley Gallery.

Tunbridge Wells, April 25th, 1877.

SIR,—I beg to call your attention to the enclosed copy of a letter which I sent to Mr. McNair on the 2nd of last February.

In reply, Mr. McNair informed me that it would be laid before the Committee at their next meeting. I have waited nearly three months, and have received no further communication from your Secretary, from which I can only infer that either Mr. McNair has suppressed my letter, or the Committee have no objection to countenance a gross injustice and imposition, which I cannot believe.

I take the liberty of writing to you as the only official besides Mr. McNair whose name is given in the catalogue.

I enclose a rough print of my picture, which I should be obliged if you would compare with Mr. Macbeth's (No. 136).—I am, sir, yours obediently,
H. P. ROBINSON.

Edward Hamilton, Esq., M.D.

9, Portugal Street, Grosvenor Square, April 30th, 1877.

SIR,—I beg to acknowledge the receipt of your letter and enclosure of photograph, &c.

Mr. McNair did not suppress your letter of February 2nd.

I cannot myself see on what grounds your letter is to be brought before the Committee.

Your grievance, if you have any, is with the artist who you say has copied your picture.

How was the Committee to know that the drawing of Mr. Macbeth's was a copy of yours? And surely you can hardly suppose that after the Exhibition has been opened to the public, the catalogue printed and published, the Exhibition was to be altered and deranged, and a fresh catalogue printed, because you think an artist has copied your photograph.

I should be glad to know what your complaint against the Committee consists of, so that I may be able to bring something definite before them.—I am, sir, your obedient servant,
H. P. ROBINSON, Esq.

EDWARD HAMILTON.

Tunbridge Wells, May 5th, 1877.

SIR,—Absence from home must be my excuse for not replying to your letter before.

I pointed out in my letter to your Secretary that a copy of one

of my pictures had been sent to your Exhibition as an original picture. I asked to have my complaint placed before the Committee. It was not for me to dictate to the Committee what they should do to vindicate the honour of their Exhibition. I knew there were gentlemen on your Committee who would not countenance a theft disguised under any circumstances whatever, but I expected that the artist who had perpetrated the imposition might possibly have been warned that in future he must not break your rule that no copy be sent for exhibition. I expected that as the drawing was in some sense an attempt at a fraud, it would have been withdrawn from sale, if not from exhibition. I expected that your Secretary would fulfil his promise, and place my letter before the Committee, which was not done.

I have no complaint against the Committee. The Committee has had no opportunity of doing me justice, or the reverse, not having had my letter before them. I am sorry I cannot get my letter under the consideration of the Committee, but my purpose will be nearly as well served, if not so pleasantly, by the publication of this correspondence for the guidance of photographers in similar cases where their thoughts and designs are "conveyed" in a like unblushing manner.—I am, sir, yours obediently,
H. P. ROBINSON.

Edward Hamilton, Esq., M.D.

Dudley Gallery, May 8th, 1877.

SIR,—I beg to inform you that your correspondence was this day laid before the Committee, and to state that no meeting of the Committee has been held since the opening of the gallery, until quite recently, and, therefore, that your letter had appeared to be neglected.

The Committee regret that there should be any appearance of plagiarism on the part of the artist to whom you refer; but they consider that the matter rests entirely between the artist and yourself.—I am, yours obediently,
H. P. ROBINSON, Esq.

ROBERT MCNAIR.

To the Exhibitor of the Copy.

Tunbridge Wells, May 9th, 1877.

SIR,—In the Dudley Gallery is a drawing (No. 136) to which your name is attached in the catalogue. This picture is a direct copy of one of my photographs. I have had a correspondence with the Secretary and Treasurer of the Gallery on the subject of this misappropriation of my property, which correspondence I am about to publish; but before doing so, I think it only just to give you an opportunity of explaining, if you can, why you have copied my picture, and why you call it your own, seeing that the design, invention, composition, and light and shade, are mine. I may add that the photograph is my registered copyright.—I am, sir, yours obediently,
H. P. ROBINSON.

James Macbeth, Esq.

23, Newman Street, Oxford Street, London, W., May 10th, 1877.

SIR,—I am obliged by your letter, which gives me an opportunity of clearing myself from the charge of infringing your copyright. I saw the photograph in the house of a friend. I borrowed it to assist me in some of the minor details of the water in the drawing you complain of, supposing it was a photograph from nature done for the use of artists, who are, as a rule, the only buyers and appreciators of such works. Had I known that the design, invention, composition, and light and shade were your own, I should have no more thought of using it than I should think of copying a picture by a brother painter.

The Secretary and Treasurer of the Dudley Gallery are in no way accountable for the matter, and the publication of your correspondence with them would serve no good purpose. If you like to publish this letter you are at liberty to do so.—I am, sir, yours truly,
J. MACBETH.

Mr. H. P. Robinson, Tunbridge Wells.

Tunbridge Wells, May 22nd, 1877.

SIR,—In reply to yours of the 10th, allow me to say that the mistake you and some other artists make is, that photographs are as much open to you to copy as nature herself, just as if they were taken by chance and were common property; whereas the best photographs are almost, if not quite, as much the result of artistic design as paintings.

As to you having borrowed "minor details," only a glance at the two pictures would convince anyone that the sea is copied in every detail as nearly as you could do it. Suppose a dozen painters had copied the same photograph, whose would have been the original picture? It is a fact that I intended to make a painting based on the photograph of mine you copied. If I fulfilled my intention, and sent the picture for exhibition, it would be said at once that

my painting was a copy of your drawing, just as if I had stolen your sketch, from nature, of the subject, and copied it.

There is a purpose to serve in publishing the correspondence which you do not seem to see. It would serve to make known to painters a fact of which some of them do not appear to be fully aware, which is, that there is as much property in a photograph as in a painting, and that it should not be appropriated without permission. I do not object to painters taking hints and suggestions from my pictures, just as they may from the works of artists in other materials; but I do object to your sending a copy of my picture to an exhibition, and calling it your own.—I am, sir, yours obediently.

H. P. ROBINSON.

James Macbeth, Esq.

MAGIC LANTERN AS AN AID TO INSTRUCTION.

SIR,—The present season of the year may not strike you as the most suitable for a paper on the magic lantern, but there is this to be said in its favour—that the makers are now laying in stock for the next winter, and hence they are in a good position for adopting any improvements which may be suggested.

I must begin my letter by expressing the obligations I am under to Mr. S. Hightley, for his valuable articles on the lantern in the fourth volume of "Casell's Technical Educator." They have added much to my stock of knowledge on the subject, both in the theory and practice. As an instance of the former, I may mention his remarks on the symmetrical condenser now so much in use; and of the latter, the hint which he gives for steadying the jet and lime-holder by fling away the supporting rod on the side opposite to the screw. This simple plan is so effectual for the object designed, that it ought to be generally known and adopted.

I have long used the lantern for educational purposes, and have recommended it to my brother clergy. The difficulty with many, however, has been that they cannot obtain coal gas, and they find the oxy-calcium process with spirits of wine not easy to manage.

Mr. S. Hightley, in his paper before referred to, describes an oxy-spirit lamp which seems perfect in all its arrangements, but I have never met with one of that construction. The lamp which I have seen is an ordinary fountain lamp, and in this form the light is apt to fail when the lantern is tilted upwards. My own plan has been to work with Pumphrey's Vaporiser, when I cannot get coal gas. It is an inexpensive apparatus, and can be used with any lantern, the spirits being volatilized, and burnt without a wick at the mouth of an ordinary safety jet. There are, however, two or three points to be observed in order to ensure success.

Much depends upon the construction of the burner. If you use an oxygen nozzle with a very small bore, and force the gas through it by strong pressure—say fifty-six pounds or more on the bag—there will be a dark nucleus in the centre of the incandescent lime spot, supposing the cylinder of lime to be somewhat near to the orifice of the jet. And not only so, but on looking into the anterior glass of the lens from the front, you will see the same dark centre, with a ring of light surrounding it, something like an annular eclipse of the sun. The explanation is that the two gases are travelling at so different a rate at the time of their emergence from the jet, that they do not mix properly, and hence there is an excess of oxygen in the middle of the flame, producing a cooling effect.

I have heard it said that the greater the pressure on the gas-bag in the oxy-calcium process, the better the light; but in my own practice I find quite the reverse, and have obtained the best results by using a low pressure not exceeding twenty-eight pounds. The oxygen then travels slowly, and mixes more thoroughly with the spirit vapour before the flame touches the lime. Quantity of oxygen, however, is important, and hence I enlarge the bore to one-twentieth of an inch, to compensate for the diminished pressure. A single trial will show the advantage

of this enlargement of the bore, the light being better and more steady, whilst the lime requires to be turned seldom, or not at all.

Look at the matter from a common sense point of view. In this oxy-calcium process you have spirit or benzoline vapour escaping slowly through a large orifice of a quarter of an inch in diameter, and you send a small and rapid stream of oxygen into the centre of it. Unless, therefore, the lime cylinder be at some distance, the two gases cannot mix. When, however, you use a larger stream, and one whose rate of travelling corresponds more nearly with that of the spirit, the admixture is perfect: and complete combustion is the result. At all events, whatever the theory may be, there is no doubt that in practice the latter method gives the best result.

I have mentioned one-twentieth of an inch as a useful size for the oxygen orifice; but I may be asked, how is the hole to be measured by an amateur without the proper appliances? It may be done sufficiently nearly by stamping it on a sheet of paper, and making five impressions, side by side, which ought then to measure a quarter of an inch; or by picking out a stocking-needle which exactly fits into the bore, and pricking a few holes on paper close together.

Having very little spare time at my disposal, and finding the process to work well, I did not experiment in the direction of altering the size of the exterior spirit orifice, which, in my instrument, measures a quarter of an inch across; but I believe it would be an advantage to make it smaller. This would economise the spirit, and, as there is a *vis a tergo* in the shape of a lamp boiling the spirit at the other end, it would give increased force to the stream of vapour, and so improve the light.

Mr. David Young, of Manchester, sent me, some time since, a burner which he names "the economic jet," and I found the light given by it in the ordinary blow-through process to be remarkably good. I allude to it now because the mouth of the hydrogen tube was much contracted, measuring, possibly, not more than one-eighth of an inch across. This jet, however, did not, in my hands, answer with the spirit vaporiser, as there was a strong whistling or humming noise, which I could not overcome except by reducing the pressure on the oxygen until it was too low to give the requisite amount of light. The jet was not convertible, or I would have removed the oxygen nipple, and inserted one with a larger bore, which I doubt not would have made the flame quite noiseless.

I noticed, further, in Mr. Young's jet, that the oxygen orifice was below that of the hydrogen; whereas in the common mode of construction the oxygen pipe projects above the other, and passes into the flame. These small points are not by any means unimportant, but should be carefully studied, with reference to the particular process to be employed. A suitable burner is as necessary, in its way, as a good condenser, and the makers have now a leisure time in which they can prepare for the next season. An interchangeable jet, with spare nozzles to screw on as required, is, in my opinion, the most useful form: some with large holes to use in the single lantern, with low pressure, and others with smaller holes for the binomial lantern, when the flame is to be turned down to the blue; the large bore will allow the flame to pass back (in the oxyhydrogen process) unless it be kept at the full height, which would disturb the lecturer, although unattended with danger.

One remark more, and I will close my letter, which has already exceeded the limits assigned to it. A beginner will perhaps find a difficulty in centering the jet in the lantern when it is heated by the small lamps employed with Pumphrey's vaporiser. To avoid this, let him cut a circle of paper the size of the condenser, with a small hole in the middle, and stick it on the back glass with a wafer. He will then see exactly the height at which the jet should be fixed to bring the lime spot on a line with the optical

axis, and it will remain only to cut a half cork, or a piece of soft wood, and tie it, underneath, on to the supporting pillar, so that for the future the jet may be dropped on to it, and screwed up securely.

I have mentioned already that I work the oxycalcium process with the lime cylinder rather near to the jet, although not quite so near as in the oxyhydrogen process. In all comparative experiments the distance from the jet should be noted, as it has an influence upon the result. I may add that the *soft* limes are preferable to the hard when low pressure is to be employed.—Believe me to be, yours faithfully, T. FREDERICK HARDWICH, Formerly Demonstrator of Chemistry and Lecturer on Photography in King's College, London.

THE NITRATE BATH.

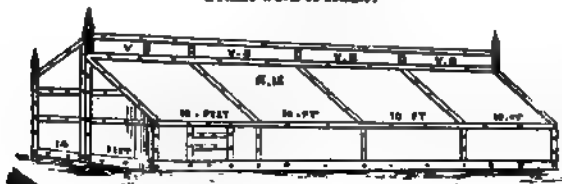
DEAR SIR,—The bath defects described in the article in last week's News by W. K. Hosken answer very much to those I treated in an article I sent to the YEAR-BOOK of 1876; and if he finds the new bath go the same way after a short period, he had better look to the distilled water he may be using for the source of the annoyance. When these fine lines make their appearance, the bath in all other respects works beautifully, and keeps good. I always find it rather overcharged with nitric acid, and nothing seems to cure it but first making it alkaline, then reducing to dryness, fusing, and making up again with pure water. Ordinary water, with a little permanganate of potash added, and also a little silver, and then passed through the filter, answers well. As these lines always appear in the hottest weather, these few words may prove reasonable.

I have something to say on Rembrandt lighting and retouching, but leave this for the present.—Yours truly, S. Cheapside, E.C. GEO. HOOPER.

PORTABLE STUDIO.

DEAR SIR,—Seeing in your last edition a correspondent "W. H. M." wishing to receive some information as to the erection of a portable photographic studio, I have much pleasure in forwarding a copy from the plans of a studio I erected three years ago for my brother, who was going to commence business in Australasia, and he being a lover of perfection in all things, thought he might encounter some little difficulty in getting joiners sufficiently skilled to undertake the erection of a good photographic studio; and to meet this want no expense was spared to make his outfit complete. The studio in question was erected at a cost of £200. Exclusive of furniture and fittings, it is thirty feet long by fourteen feet wide, with one large side-light which is always placed to face the north; the side glass is six feet high, and that of the roof

Frame work of studio.



DESCRIPTION OF PLANS.

18A, frame work of studio, showing joints, screw bolts, &c.; V8, ventilators; 13C, beam showing the joints and screws; 14B, beam showing iron plates.

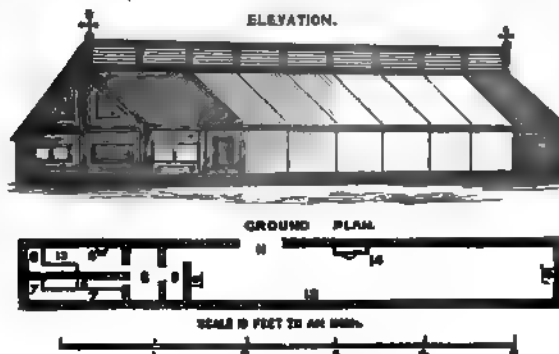


Floor of studio, 40 feet long by 14 feet wide.

fourteen feet long, and made in sashes five feet wide; the length of the centre pole is fourteen feet high, and eight

inches square; the back pole is twelve feet long and eight inches square, and has two feet slope of roof at the back, and the glass side has a slope of eight feet, which does not give it the slightest opportunity of leakage in the wet test weather, a fact which cannot be too highly estimated in a good photographic studio.

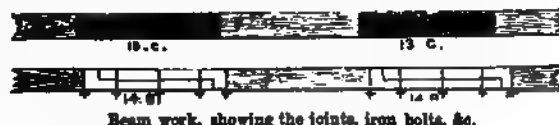
The dark portion is made in panelled sashes of not more than five feet wide and high, according to the portion it belongs. The supporting beams are forty feet long in all, the dark room being placed at the end, and also a printing and painting room; but these beams can be divided into three by means of screw bolts and iron plates. The cross poles fit into sockets, and are bolted in like manner to the rest, and when these joints are screwed up they are firmer than if they were all in one piece, and the whole may be taken down or put up in two hours by the aid of two men,



14, stove; 10, backgrounds; 12, glass side; 11, door; 9, passage; 8, painting room; 16, printing room; 13, dark room.

and forms one of the most elegant, comfortable, and healthy studios a photographer could wish to work under. It is fitted with a set of spring blinds, also a set of velvet curtains, lined with black twill, which will allow it to be shut in complete darkness if required. The glass sashes can also be shut in by means of sliding shutters to prevent being broken when out of use.

It is heated by two of Alexander and Allan and Co's oil stoves, which are very portable, and give the required amount of heat without dirt and attention of a coal or coke stove. It is a great annoyance—especially when you



Beam work, showing the joints, iron bolts, &c.

are busy with some very important personage—for the boy to come and mend the fire, and create a dust, or let a little smoke escape when closing the door of the stove; for, strange to say, the smallest portion of dirt or smoke can always find its way to the dark room.

I think I have given you all the information necessary to explain the structure of the portable studio; but if I have not been definite in detail, I shall be most happy to supply any further matter that may be required, either by letter, or in the PHOTOGRAPHIC NEWS.—I am, dear sir, yours, &c., JAMES H. CORSCADEN.

OXYGEN GENERATING APPARATUS.

DEAR SIR,—Yesterday my attention was drawn to an article in your issue of May 25th, entitled "Another Improvement in Making Oxygen," by Mr. David Young; and at the same time Mr. David Young's specification of patent was placed in my hands. I was rather surprised to find that Mr. Young had taken out a patent for an oxygen generating apparatus which has many years ago and very often since been made and sold by myself, and now is and has been in constant and general use. So near are Mr. Young's specification, his drawing, and description of the apparatus, to that

which I have so long since made, that one might imagine that he surely must have seen and copied it almost to the letter.

I do not claim any originality of invention, as that, so far as I know, belongs to one of a very large firm of manufacturing chemists in Manchester, viz., John Dale, Esq., Messrs. Roberts, Dale, and Co., Cornbrook Chemical Works. The apparatus consists of a retort, with a flange as marked 25 in Mr. Young's specification, with a clip as marked 26, which by means of a screw, 31, tightens a cover, 27, upon the end of the retort. Again, one thing which Mr. Young seems to consider new and very important, viz., the thin tube, as claimed by him in his specification, lines 42 and 43, page 3, for holding the charges of oxygen mixture, however important it may or may not be, is not new, for the reason that the retorts in question, which I have so long since made, have all got thin and separate loose interior tubes for holding the oxygen mixture.

Now, in justice to your readers, I think it only proper to make the above known, so that they need not pay heavy and exorbitant prices to "would-be patentees" for apparatus, when there is not the slightest occasion so to do.

I also notice that Mr. Young has given a sketch of a vertical oxygen generator, which he does not seem to approve. I am not surprised at this, nor would I be surprised if your readers disapproved of it as he has described and drawn it. It looks to me as if he had been making a very vile attempt to imitate another person's oxygen generator, a description of which has been already published.—Yours truly,

JOHN CHADWICK,

Engineer, and an Old Amateur Photographer.

Princes Bridge Iron Works, Manchester, June 5th.

SIMPLE AND EFFICIENT DROPPING BOTTLE.

SIR.—In your last issue you gave a sketch for one of the above. Will you allow me to add another for ordinary dark room work. Flatten the glass stopper of the ordinary iodising bottle usually sent out with collodion pints—on two sides, either on a grindstone or rubbing on a flagstone—about the sixteenth of an inch; replace the stopper; the air being admitted through one side, the solution will drop to a nicety through the other. For travelling, temporarily substitute a cork; or, when you can insure your chemicals not being turned upside down, there will be no leakage if the bottle is not more than half full.—Yours obediently,

WILLIAM BALL.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on Thursday, the 31st ult., at the Free Library, William Brown Street, the Rev. H. J. PALMER, President, in the chair.

The minutes of the previous meeting having been read and passed, some discussion ensued on the difficulties of arranging the excursions so that a larger number of members might be able to avail themselves of them. Nothing definite, however, was arrived at except that it was thought advisable to join the Liverpool Naturalists' Field Club on their various excursions.

The SECRETARY then read a communication from Mr. H. Houlgrave on "Another Method of Working the Gelatine Process" (see page 268). The paper was illustrated by a number of excellent negatives, of various subjects, taken by the process. In the discussion which followed, the Secretary described the various apparatus which Mr. Houlgrave was in the habit of using.

The PRESIDENT said that the members would remember some specimens which he had shown them at a former meeting of the curious effect some gelatine films had upon stripping the dry films from the glass—namely, that the films brought away flakes of glass, making both films and glass useless. He had now to show an ordinary porcelain dish, in which some gelatine emulsion had been left to dry. The emulsion had wrinkled up, bringing with it most of the glass of the porcelain in a most curious

manner. The only way he could account for it was the contraction of the gelatine, owing to too high a temperature in drying, as the dish had not been exposed to light in a manner similar to the glass plates. He (the President) believed excessive temperature would be found the great terror of gelatine workers, for many of his failures were solely owing to heat in making his emulsions and plates.

The SECRETARY observed that Mr. Houlgrave also found that to be the case, his difficulty being to get a very slight heat without the danger of its failing or increasing during his absence. Mr. Houlgrave now used a small spirit lamp, which was perfectly successful. This lamp he had made by inserting a piece of glass tube through the cork of an ounce bottle containing methylated spirit. The tube should be just large enough to hold one thread of cotton wick. A small hole drilled in the top of the bottle admitted air as the spirit became exhausted. Though the flame was so tiny it gave out all the heat that was required, and burned for eight hours with a regularity he was unable to obtain with night-lights, gas, or other means.

Mr. J. H. T. ELLERSON recommended the use of sponge lamps, which would burn two or three days with as small a flame as might be needed.

Mr. W. H. KIRBY said it had been suggested to him to try the effect of steeping a collodio-emulsion plate in beer previous to developing. He produced a plate, half of which had been treated in that way, the other half without. The treated half was a good negative, but the beer had made the film so insensitive where it had been used that only a weak positive could be obtained.

Some views of the wreck of the steamer "Dakota," taken by Mr. W. King, on commercial plates, were exhibited. They were examined with interest; but as negatives they were valueless, being completely covered with opaque spots, evidently the fault of the manufacturer of the plates.

It was proposed that the monthly meetings should be held in July and August, instead of omitting them as heretofore. The decision on this point was postponed till the following meeting.

The meeting was shortly afterwards adjourned until the 29th instant.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 4th May, M. PELICOT (of the Institute) in the chair.

The PRESIDENT communicated to the Society the circumstance that by order of the Minister of Public Instruction, M. Chardon (to whom the dry plate prize was recently awarded) had been named an Associate of the Academy.

M. DAVANNE read a letter from the director of the Kew Observatory, thanking the Society for the medal awarded in connection with the last exhibition.

A letter was also read from the Minister of Public Instruction, acknowledging receipt of medals to officers connected with his department, and complimenting the Society on the work of progress on which it has been engaged.

M. DAVANNE said that the Minister had placed a further sum of five hundred francs at the disposal of the Society for a new prize.

It was resolved that the award should be made for improvements in travelling apparatus, and MM. Davanne, Ferrier, et Harrison were desired to draw up a programme in reference to such competition.

It was further resolved that a silver medal should be given with a view to encourage the employment of emulsions and dry plates, the award to be given for a means of completely suppressing glass plates, and replacing them with a thin, supple, light, and unbreakable film.

M. PERROT DE CHAUMOUX called attention to the foreign journals, and some articles of importance in the Year-Book and elsewhere. M. Perrot also called attention to the so-called reticulation in carbon printing. He adduced the opinion of Mr. Baden Pritchard upon the subject, and quoted the recommendation of Mr. Anthony to add five per cent. of glycerine to the sensitizing bath to obviate the defect. M. Jeuneaud advised addition of the same material some years ago.

M. BZALE stated that a good paraffine lamp gave as good results as the Drummond light, while at the same time the former was much easier to manipulate.

The lead intensifying process of MM. Eder et Toth was brought before the Society.

M. A. MARTIN presented the Society with a memoir on "Methods employed to determine the curves of lenses," accompanied by tables to assist in the calculation.

M. TERPEREAU also presented the Society with a pamphlet entitled "The misfortunes of an amateur photographer."

M. COMTE exhibited an apparatus for filtering collodion. It was a vessel provided with two openings, one for the introduction of the funnel in which the collodion to be filtered is introduced, the other having fitted to it an India-rubber bulb. By pressing the latter, the air in the vessel is exhausted, and consequently the collodion in the funnel runs down with increased velocity, since a vacuum is caused, and the atmospheric pressure acts upon the liquid collodion. In this way the filtration of collodion, which is otherwise a very slow operation, is considerably accelerated.

M. DAVANNE complained that the vulcanized rubber corks employed in the filter apparatus were to be avoided; the ether and alcohol attacked the sulphur contained in the rubber and caused trouble. He advised the use of good cork.

M. MARTIN said that if the vulcanized rubber were boiled in an alkaline solution it would be devulcanized, and thus rendered free from any baneful character.

M. DOISY exhibited a funnel for facilitating the operation of filtering; it had a series of spiral canals running round it, thus preventing the filter paper from adhering too close to the sides, when the access of air is impossible.

M. J. H. C. HARRISON submitted a new form of drying box to be employed either for the desiccation of tissue or for drying plates destined for greasy ink printing.

M. STENFURT exhibited some samples of vegetable gelatine extracted from marine algae, which has been employed for some time at Rouen in the cotton trade. Pigments are easily employed to colour the material.

M. PELIGOT observed that it would be difficult, probably, to make use of this description of gelatine in photography where salts of silver come into play, by reason of the chlorides, bromides, and iodides which it is sure to contain.

M. PERROT DE CHAMEUX believed that it might be successfully employed with bichromate of potash, and stated that M. Leon Vidal had some years ago used a similar material in carbon printing, which was termed vegetable gelatine. In England experiments had also been made with a material of a like kind called agar-agar.

MM. BILLOT ET BILLAUDOT submitted some samples of pyroxyline prepared especially for M. Chardon's process. They also submitted a sample of a compound bromide, likewise in use by M. Chardon; it was composed of a mixture of the double bromide of ammonium and cadmium, and pure bromide of zinc.

A Member remarked, in reference to the solubility of pyroxyline, that it was well to apply the ether first, and then the alcohol. If alcohol was first added to the pyroxyline a gummy mass was the result, which took a long time to dissolve when the ether was added.

M. ANDRA offered some remarks relating to his experience of M. Chardon's process.

M. PERROT DE CHAMEUX also made some observations on the matter.

M. BRAUN submitted some carbon photographs, being reproductions from the Amsterdam Gallery.

M. DUCHESNE exhibited an instrument to register periods of exposure.

M. PRASZKOWSKI submitted a simplified heliostat specially constructed for micro-photographic work.

The proceedings then terminated.

Talk in the Studio

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The last meeting of this Society for the session will take place on Tuesday next, June 12th, at 5A, Pall Mall, East, when papers will be read on "Emulsions" by Mr. Herbert Berkeley, and on "The Continuing Action of Light on Pigment Printing" by Mr. J. R. Sawyer.

To Correspondents.

BUNGLE.—The toning bath turning brown and ceasing to tone is most likely the result of contact with some trace of hyposulphite of soda. Possibly your fingers have been in contact with the fixing bath, and have then been immersed in the toning solution. This will produce the effect you describe. There is no remedy for it; you can only recover the gold by precipitation.

AMATEUR.—Different pigments are used for stopping out pinholes, each manipulator, as a rule, having his favourite material. Something depends upon the portion of the negative: if the pinholes are in a dense portion, it is important to use an opaque pigment like Indian red or cadmium yellow; if in a thinner portion of the deposit, cobalt blue answers. Some use Indian ink throughout. 2. The acetate bath will produce a good purple black if properly used. If black, rather than purple, be desired, the lime bath is perhaps better. For the latter, the following is a good formula: chloride of gold two grains, chloride of lime three grains, water twelve ounces; to be used forty-eight hours after mixing.

K. C.—You will find Newman's "Harmonious Colouring Applied to Photographs" answer every purpose.

NEMO.—The best opal prints are most easily produced by the collodio-chloride process. The opal glass is coated with collodio-chloride of silver, and printed in the usual manner. It is difficult to produce prints in the camera, by development, so rich in tone and clear and brilliant in general effect. To produce enlarged prints, camera printing is necessary. Good ordinary collodion, and bath in working order, full exposure, and quick development are necessary to produce the best results. A pyro developer containing two grains of pyrogallio acid and a drachm of acetic acid in an ounce of water will give good results.

F. H. H.—A saturated solution of protosulphate of iron, consisting of 6 ounces of the salt in 10 ounces of water, will contain 288 grains in each ounce. We quote from the best authority on solubilities. Individual experiments in such matters often differ, as there is difference in the solubility of different samples of similar salts, difference in water, and difference in temperature; and these facts are too generally overlooked. The precise strength of developers is fortunately not a point of vital interest in manipulating. 2. A thirty-five grain bath in good condition will work as well and rapidly as a stronger one. Different makers work their lenses, in order of their rapid action, differently. Dallmeyer's portrait lenses are distinguished as A, B, and C; the latter being the most rapid and best suited for babies. 3. Bicarbonate of potash differs from the simple carbonate in possessing an atom more carbonic acid. The bicarbonate is used in most delicate operations, as more care is used in its preparation. It is a white powder. The simple carbonate is in crystals, and is familiarly known as washing soda. Both are, of course, alkaline salts; but the latter is more so than the former.

J. L.—Break up your glue into small pieces, and cover with water. If the glue be really good, it will not dissolve at all or discolour the cold water in which it is placed to soak. Drain off the water, place in the glue kettle, and boil. The glue having soaked up all the water it could, will dissolve, and become liquid with heat, and in this state form a strong cement. Frequent boiling somewhat destroys its adhesive power, and also its setting power.

M. L. F.—You require a thicker solution of india-rubber. The fifteen-grain solution with a large residue which you describe is practically much weaker, probably not more than ten grains to the ounce. 2. The thin foggy image which you describe may be due to the condition of the bath, or of the collodion, or of the developer. Probably you are using a new and somewhat tain collodion. Add a little more pyroxyline to the collodion, and a few drops of tincture of iodine.

COPYRIGHT.—The copyright in a portrait taken for a customer does not rest in the photographer without an agreement to that effect. It does not vest in either the producer, or the person ordering, without an agreement in writing made at the time, stating to whom the copyright is to belong. The producer of any photograph ordered and paid for by another has no right to sell the prints without the consent of the person so ordering; but neither of them possesses a copyright without an agreement. The only case in which the copyright vests in the producer without an agreement is where he produces the photograph at his own charge and for his own purposes. The cost of registration is one shilling for the fee, and one penny for the "form" to be filled up. Personal attendance at the Registrar's Office is necessary. Our Publisher will superintend the proper entries, and pay the fee of a form properly filled up, if one shilling and three pence in stamps be sent to him. A separate entry and separate fee is necessary for every view of any object. One entry and one fee only protects the picture in one negative, and any other negative with the slightest variation requires separate entry and fee.

CONFUSED.—Your former letter was mislaid; but, as you will perceive, is answered above. Your difficulty with opal glass arises from a simple cause; you are using flashed glass, and must, of course, use the flashed side, or you will get the effect of a double image and want of sharpness. If the flashed side is rough, it is imperfect; you must get the polished kind. Pyro will give you a warmer, richer toned image than iron.

C. WARMAN.—The letter was addressed and posted.

EASTBOURNE.—There is no reason why you should not register your copyright in the crying child; but you had better give it a distinct title instead of borrowing from a painting.

W. MATTHEWS.—In our next.

Several Correspondents in our next.

The Photographic News, June 15, 1877.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.****DALLAS' PHOTO-MECHANICAL PROCESS—A TRAVELLED LADY PHOTOGRAPHER—THE JABLOCHKOFF LIGHT.**

Dallas' Photo-Mechanical Process.—Mr. Duncan Dallas is again to the fore with an improvement in photo-mechanical printing. Most of our readers have seen the charming bijou productions in the form of a miniature *Pall Mall Gazette*, *Fun*, *Times*, &c., which were produced by the so-called Dallastype; and now one step more of progress seems to have been made, for under the title of Dallastint, Mr. Dallas has successfully elaborated a process which gives half-tones in the printing press. The examples we have seen of the Dallastint process promise well for its future. One specimen was especially good. It was a business card of some drapery, or, rather, millinery establishment, and the main feature was a reproduction of a lady's bonnet, apparently in the latest fashion. The bonnet could, of course, have been engraved, and the block printed with the type in the ordinary manner, but had this been the case the result would have been far less pleasing than that secured by the Dallastint. The latter presents us with sketch and type all printed with the same ink, but the sketch, as one can see at a glance, is a veritable photograph of a bonnet, the straw thereof, and the ribbon serving to trim it, being most perfectly reproduced, and standing out in relief with all the characteristics of a camera picture. If Mr. Dallas can perform work like this, there will be plenty for him to do, for the production of a half-tone photograph, along with type, in the printing press, has been a stumbling-block over which many photographers have fallen. Some photographs of cloth, which he has also printed in the press, further demonstrate the capabilities of the process, for here, although we suppose the results are simply intended as tailor's patterns, the delicate fibre and phases of the pattern are reproduced with exceeding fidelity. We do not suppose that Mr. Dallas would succeed so well where he has wooded landscapes or foliage to deal with; but in the applications he has made of his process—and these must be infinite, if one could only think of them—he has hitherto been very fortunate. For business purposes, and also for book illustrations, the Dallastint should find plenty of applications.

A Travelled Lady Photographer.—Mr. Thomas Brassey's voyage round the world in his yacht *Sunbeam* is probably the first occasion of a pleasure craft having been taken by its owner upon such an excursion. Mr. Brassey was accompanied by his family and by Mrs. Brassey, who, as many of our readers know, is an accomplished photographer. We may, indeed, hope to see an interesting collection of pictures which have been brought home from this extensive voyage, for, as we have already notified in this journal, the little vessel had a portion of her hold fitted up as a photographic laboratory. It was a happy idea of the owner to make such an arrangement, for a tour such as has just been accomplished is a thing to be attempted but once in a lifetime. The reminiscences, therefore, which the photographs taken at the various spots visited will call up hereafter will be exceedingly pleasant, and from the fact that they were secured by the travellers themselves, they will be valuable, no matter whether perfect or not. The *Sunbeam* crossed the Atlantic and passed south of America into the Pacific, and then made a direct cut to Japan across the whole breadth of the ocean, Mr. Brassey calling at any of the islands in the Pacific just as he fancied. From Japan the little yacht went to China, thence to Singapore, and finally came, by way of the Suez Canal, to England. If Mrs. Brassey has made good use of her camera during the chequered journey, the yacht should have brought home a fine collection of pictures from all parts of the world; and it is to be hoped that

she may be prevailed upon to permit the public a peep at the interesting series, either at the autumn exhibition of the Photographic Society, or at some other opportunity. We congratulate Mrs. Brassey upon being the first amateur photographer who has attempted such a grand tour.

The Jablochkoff Light.—The new electric light or candle to which we have already referred in these columns, and which has been termed, after its inventor, the Jablochkoff light, is being experimented with in this country. Last week an extensive trial was to have been made at the West India Docks, and arrangements were made for illuminating a warehouse and quay by its means, to prove that the loading and unloading of a vessel could be carried on under such circumstances as well as in daylight. Unfortunately, the engine provided for the purpose broke down after a few preliminary trials, and the grand event of the evening did not come off. Four "candles" were, however, lighted up in the tent as a preliminary experiment, and these showed how simple and feasible the invention is. If the reader will imagine a candle with two wicks—the same being separated not by tallow, but by China clay or kaolin, so well known to all photographers—he will have a very good idea in his mind of the Jablochkoff light, only the wicks are in this case rigid and made of graphite. The "candle" burns away like other candles, but in a different manner somewhat. Electricity passes to the wicks, which represents, indeed, two electric wires kept apart or insulated from one another by the kaolin. The electricity from the two poles or "wicks" becoming united at the top of the candle a vivid current is the result, which has the effect of fusing and rendering incandescent the kaolin between the wicks. The kaolin at the top of the candle then emits a brilliant yet soft light—one, indeed, which the human eye may look at when surrounded by an opal globe. In the ordinary electric lamp it will be remembered the light is not only excessively intense, but the illuminating point, being but a spark, is of the most minute dimensions. In the "candle," however, it is a heated mass that emits the light, and hence the source is larger, and at the same time less intense. As the kaolin gradually fuses, the graphite wicks burn away, and so the "candle" burns down until all the kaolin has gone. This takes, however, some time, and a "candle" will last for hours. The Jablochkoff light, we may hope, will furnish us with the solution of electric illumination, for it overcomes at once two great difficulties we have hitherto had to contend against: it gives us a means of keeping the light uniform, and above all constant; and, again, it gives us a means of softening the vivid intensity of the rays. It is now seventy years since Sir Humphrey Davy exhibited the first electric light in this country at the Royal Institution, and yet to-day we know little more of this valuable illuminating agent than we did then. One would have thought that by the way science has progressed during the past half century, we should by this time have adapted it to our every-day uses, and that at the present moment our streets, bridges, squares, tunnels, theatres, &c., would all be lighted up by electricity. Yet we still regard the electric lamp with wonder and admiration, and have still to become familiar with it. The applications that have been made of it, however useful they may have been, are regarded in the light of extraordinary events; and if we have adopted electricity permanently in some of our lighthouses, this has only recently been the case. True it is that we have done something, so far as the generation of electricity is concerned, and no longer have recourse to a battery of four thousand metal plates, like Davy on the occasion to which we have referred. We now get our electricity from magneto-electric machines, and the quantity produced is in proportion to the power of the steam-engine employed to grind the armatures of the magnets. The amount of electricity is, indeed, only governed by the size of the magneto-machine and the power employed to drive it. Let us hope that the Jablochkoff light, which seems so

simple and effective in its action, may furnish us with the solution to a problem on which scientific men have been engaged for nearly three-quarters of a century.

THE NITRATE OF SILVER BATH.

BY B. J. EDWARDS.*

I MAKE no apology for calling your attention this evening to the old well-worn subject of the nitrate of silver bath. From the first introduction of the collodion process the bath has been to photographers a subject of the deepest interest, and often of the greatest anxiety. A good working bath, and one that can always be depended upon, is a source of joy and satisfaction to the conscientious operator, while a bath that is always getting out of order is a constant source of trouble and annoyance.

Until the happy time arrives when the photographer shall be able to dispense altogether with the silver bath as an essential part of the collodion process—and looking at the rapid strides made by emulsion processes the time may come sooner than we now expect or hope—the question of how to keep the silver bath in perfect working order is one which demands and deserves the most careful consideration.

If we consider for a moment the nature of the reaction which takes place when a plate coated with iodized collodion is immersed in the silver solution, we shall at once understand why it is that a silver bath in constant use so often fails to give satisfactory results. With such plates immersed a change takes place both in the materials and proportions of which the bath is composed.

A bath of pure silver and pure water will give, perhaps, the most perfect results it is possible to obtain; and with such a bath all will go well up to a certain point, after which deterioration, more or less rapid, sets in, and the bath eventually becomes unfit for work. For this reason constant efforts have been made to discover some substance which could be added to the plain solution of silver, which would have the effect of keeping the same in working order, or restoring it when contaminated by the unavoidable introduction of foreign and injurious substances.

Many things widely differing in character have been proposed, and more or less successfully used, for the above purpose; among others, I may mention nitric acid—at one time the panacea for all the ills the bath is afflicted with. Cyanide of potassium was suggested by Mr. Tully ten years ago, and has been lately strongly recommended by others who have tried this method. Nitrate of iron has been recently suggested by Mr. A. L. Henderson, who has also used and strongly recommended nitrate of baryta as an addition to the bath: and, lastly, we are advised to try an addition of a little hyposulphite of soda.

I do not propose in this paper to discuss the relative merits of the various remedies I have just alluded to—and most of which, except the last, I have carefully tried—but will at once describe my method of making and treating the nitrate bath. I do not claim the plan of working as a startling novelty, but it is one which, in my hands, has done good service in my daily work in the studio for the last three years; and in the hands of others who have it in constant use it has never failed to give uniform and satisfactory results. The formula is as follows:—

Solution No. 1.

Nitrate of silver (in crystals) ...	1 ounce
Common water ...	80 ounces.

Dissolve the silver in a Winchester quart bottle containing the above quantity of water, and expose to the sun's rays or ordinary daylight for at least twelve hours: with some kinds of water it will be advisable to boil and filter before adding the silver. It is better to make several Winchesters of this solution, and expose to light until required for

use. The clear solution will be a sufficiently pure and neutral solution of silver, about five grains to the ounce: it should be allowed to settle perfectly before being decanted and filtered for use, and great care should be taken not to disturb the sediment when pouring the solution into the filter. This precaution is absolutely necessary, as otherwise it will be difficult to filter the solution perfectly bright and clear. The best way of filtering is to well wet a tuft of cotton wool by holding it for a few minutes under a tap, and press it gently into the neck of a large funnel of glass or porcelain. Filter papers should be avoided, as they are apt to contaminate the solution.

To make a new bath, dissolve two ounces of nitrate of silver in twenty-six ounces of the No. 1 solution; then add four drachms of the following:—

Solution No. 2.

Iodide of calcium ...	30 grains
Distilled water ...	5 ounces.

Shake the bath after adding the No. 2 solution, and let it stand for a few hours; then filter, and the bath will be ready for use.

Plates excited in the bath made as above will be very sensitive, and the negatives perfectly free from pinholes; the solution will keep in order for a long time, and as soon as the films begin to show signs of the slightest deterioration from stains or insensitiveness, the bath solution is to be treated in the following manner, when it will be found that it is at once restored to perfect working order, and will produce negatives equal in every respect, if not superior, to those made in the new bath. To rectify the bath, pour the solution into a large flat dish or tray, and allow it to evaporate to about two-thirds of the total quantity; now test the concentrated solution with the argometer, and make up to the original strength, of thirty-eight or forty grains to the ounce, by adding a sufficient quantity of the No. 1 solution; filter, and the bath will be ready for use. The above treatment may be repeated as often as necessary; it has never yet been known to fail to restore a bath, however hard worked, to perfect working order. The fresh silver in the No. 1 solution will be found sufficient to replace the silver used in exciting the plates, thus keeping the bath of about the same bulk.

With regard to the best way of evaporating the bath, it is only necessary in the summer time to pour the solution into a large porcelain dish or *papier mache* tray, and leave it freely exposed for a few days in a warm place, or, in dry hot weather, for a few hours only. This plan of evaporating is by far the better one; but in the winter in this damp climate it is often necessary to use an evaporating dish, which can be placed in an oven or over a lamp stove without danger of breaking. There is no advantage in boiling the bath unless albumenized plates have been used, when the solution must be boiled to get rid of the albumen dissolved in it.

It is recommended, for the convenience of working, that two baths be kept in use, so that while one is laid aside to be treated as above, the other will be ready for work.

In making a new bath, do not on any account adopt the usual plan of iodizing with iodide of potassium, and avoid the use of a collodion containing a potassium salt. In the course of the experiments above alluded to it was abundantly demonstrated that the use of potassium in the bath or collodion is a fruitful source of pinholes.

The negatives should be soft and full of detail, clear in the deepest shadows, and of a reddish-brown colour. A cold, grey negative, wanting in gradation, and with the film partially eaten away in thousands of minute spots, is the result of a bath not sufficiently iodized. The remedy, whether for a new bath, or one that has been rectified as above, is to add to each pint of bath a few drops of the No. 2 solution, and filter for use.

With regard to the exact way in which the adaptation of the iodide of calcium to the bath, and the consequent for-

* Read before the South London Photographic Society.

mation of nitrate of lime in the solution, affect the working quantities of the bath—and especially in preventing pinholes—I would like to leave that matter in the hands of some of our able chemists who may care to investigate the subject. I may, however, just suggest that, as it has been proved that sulphate of silver is a prolific source of pinholes, it is possible that the nitrate of calcium in the bath acts as a safeguard against the formation of sulphate of silver, by taking hold of any sulphuric acid with which it may come into contact, and forming the insoluble sulphate of lime, which would be precipitated. Be this as it may, it is a fact that I have restored an old bath, giving a fine crop of pinholes, by simply adding the solution of iodide of calcium in excess, and filtering.

I find that the bath is best when fully saturated with iodide; in fact, I do not think it possible, under any circumstances, to over-saturate a bath with iodide of silver.

In conclusion, I shall be happy to answer any question, or to give such further information as any member may require; and I trust that all who adopt the plan I have described will find, as I have done, that whatever other difficulties may arise in the practice of photography, there will be no further trouble with the nitrate of silver bath.

A FEW EXPERIENCES IN THE STUDIO.

BY PETER LOW.*

I DESIRE to say a few words to-night by way of encouragement to amateur photographers, with, perhaps, a few hints to aid those who are just beginning to try their 'prentice hand in that portion of our beautiful art which, as a matter of course, I consider the highest, as well as the most interesting. I refer to portrait photography. Is it from the difficulties that have to be overcome, or a wish to avoid that particular domain of the professional, that so few amateurs attempt great things in the way of portrait or subject studies? I really think more might be done in that direction than I have either seen or heard about. Why not try composition, or even simple subject pictures, and not always views? What a field to display artistic thought and talent, and what an amount of pleasure might be given to others by a quaint conceit or a happy thought conveyed to our minds by such means; and as in many cases amateurs could afford more time for such studies than the professional photographer, it would be a great help to give that portion of our art the attention and prominence it deserves. I speak for myself when I say I am sorry I cannot, from press of business, devote a little of my time on picture subjects produced by the camera, by way of a little help and encouragement to any amateurs who may think of trying to photograph the "human face divine." I do not think it would be a bad plan to run over the taking and finishing of a portrait negative; at the same time I confess it would come easier for me to give practical illustration, to be understood better than I can hope to be by the pen. I have always found that beginners, either in painting or photography, are apt to imagine that a great deal, if not all, depends on the amount and variety of compounds used; however, as they gain experience, they find out that the simple palette, both of colour and chemicals, is the best, and the production of good pictures in either branch of art depends, not so much on the materials used, as on the amount of talent and perseverance in the user. With these few remarks we shall go to work.

In the first place, prepare your plates by first rubbing them with nitric acid and water, wash well under the tap, and, while still wet, flow the plate over twice with albumen (white of an egg to twenty ounces of water, filtered), and add a few drops of carbolic acid. This I have used for many years, and, must say, I have not found it to injure the bath in the least; by using it you can be certain of a

clean plate, and the film will be held firmly on the glass. Make up the nitrate bath of the usual thirty-five grain solution; and I have found it from experience to produce the best results, and to be more depended on, if no fresh silver be added to the bath as it is used; but simply, when it shows signs of decay, to put it and a handful of salt into the silver washings of the prints, and make up a fresh one. You thereby save reputation and temper, and get that bloom on the negative which I found impossible to get in an old bath. The key-stone to all good pictures is the bath, and this may seem to cost more than adding silver from time to time; but I do not think you will find it so in the long run. Filter your bath as seldom as you possibly can.

Collodion.—A mixture of two good makers works the best when a few days old; make up a little at a time, so that you may get plenty of detail, softness, and quickness of working.

Lighting.—A great fault in amateurs is using too much light; you will be surprised how little you can work with, if it be well directed and under control. An eight feet roof and side is quite sufficient, cutting off nearly all front light by a curtain, and then gently relieve the shadow side by the reflector. The one I use consists of two screens four feet square on a stand so arranged that the light can be thrown up; however, any arrangement will do, provided you use it properly. A newspaper on a head-rest makes a very good reflector, not putting it so close to the sitter that the shadows are destroyed, or the disagreeable effect of a cross light is produced, but just enough to enable you to see into the shades of the finished picture, and light up dark and heavy shadows; give a good exposure, and do not mind for one moment the impossible short exposure spoken about in most cases. Expose for your half-tones, and let the lights and shades take care of themselves. A great number of otherwise good negatives are spoiled through under-exposure; an over-exposed negative can be improved, but little can be done to an under-exposed one.

Developer.—One that is useful for all classes of work is—

Sulphate of iron ...	...	...	1 ounce
Iron of ammonia ...	...	...	1 "
Spirits of wine ...	...	...	1 "
Glacial acetic acid ...	...	...	1 "
Water ..	...	...	8 ounces

Put as little on the plate as you can, and do not rock it about. Keep on till every bit of detail is well out. If you can possibly do without, do not intensify. I find it better, when required, to do so after fixing, using a very weak solution of pyro and acid, and a few drops of silver, just enough to turn the negative to a greenish hue; but as a rule I do not intensify at all. I wish to impress the importance of keeping your negatives delicate, as you are apt to destroy the half tones. Negatives thicken as they dry, especially if you use heat. Varnish with a good hard varnish, and rub a little powdered resin on the face, to give it a good surface to take the pencil; retouch carefully with a pretty hard pencil, softening without entirely removing all hard lines; put lights on softly, and in their proper place. It will prove you have done the retouching wisely and well if you can see the skin of the face on the finished photograph, and not white paper. I am afraid I am touching on a sore point with some of the members who do not advocate improving the negative, but for one that does not require modelling, there are at least a hundred that do. Do not hesitate to remove any blemish or defects you cannot see by the eye in the person photographed. Most portrait painters, I find, object to retouched work; but, at the same time, they know well that what are called the pearly tints of the face are lost in the photograph. The delicate blue or green tints that so beautifully soften the edge of every shadow or wrinkle are not produced in the best negatives, and all require softening more or less to supply that defect in our chemicals. To model as it should be done requires a good deal of practice,

* Read before the Edinburgh Photographic Society.

and, above all, to know when to stop. Use the pencil on the face of the negatives, softening the shadows with crimson-lake on the back of the negative. Put on with a hard brush in the form of a stipple. The bath for paper which I find gives the best results is a fifty-grain solution, to be kept up to that strength, using a large bottle of solution, which only requires filtration once or twice in the year. All that is required is to decant carefully, and not disturb the sediment.

The toning bath I can recommend as a splendid keeping one is as follows:—

Gold	...	...	...	15 grains
Chalk	...	...	...	1 tablespoonful
Saturated solution of soda	...	...	...	60 drops,

to a Winchester of hot water. When cool, it is ready for use.

With the above you can procure any tone required, providing your negatives possess good printing qualities.

On the table you will find a few groups taken at Holyrood last week. They are simply developed, slightly washed, and not fixed till the evening. Others taken the same day were not finished till the following morning. I merely mention this to show that negatives are not spoiled by being kept for some time, but rather think they improve.

COLLODIO-ALBUMEN AND OTHER DRY PROCESSES.

BY GEORGE W. HEWITT.*

THE collodion, after being applied to the plate, is allowed to set well—rather longer than is usual in working the wet process. As soon as immersed in the bath, the plate is kept moving in a lateral direction by means of the dipper for twenty seconds; it is then allowed to remain in the bath from four to six minutes, depending on the temperature; it is then removed and taken off the dipper by catching one corner of the plate with a small piece of filtering-paper held between the fingers, and placed in a dish of rain-water slightly acidulated with acetic acid; the dish is moved so as to cause the water to wash across the film for a few moments, and then left while another plate is placed in the bath. The first plate is then taken up as soon as the greasy lines disappear from its surface, and is rinsed under the tap once only (not washed). A small portion of the filtered preservative is then applied to the film from one end of the plate, and is allowed to traverse the plate, driving the water on the plate before it. It is then drained off, and a second application made of fresh preservative, which is worked into the film by inclining the plate, and causing the solution to move in wave lines across its surface for about a minute; it is then drained off, and washed under the tap for a minute. After this washing flow over, for a few seconds, water one ounce, glacial acetic acid fifteen drops; then wash well, and finally flow with water one ounce, and the alcoholic solution of gallic acid fifteen drops. Dry spontaneously, or by moderate heat.

This seems like a lengthy operation, but in reality it can all be accomplished while the second plate is sensitizing; and as that interval cannot be decreased in any bath-process, the time between may as well be occupied as not. I usually make a half dozen 4-4 plates in little over half an hour. One of the greatest drawbacks in all bath dry processes is the tendency to streaks in the direction of the dip; by the lateral motion of the plate in the bath this is obviated, provided the bath has not been too much used. A bath that will work satisfactorily for the wet process may be completely unfit for dry plate work, from the accumulation of alcohol and ether in it. A clean bath in this respect is very essential. In moving the plate in the bath, should the latter be somewhat old, care should be

taken that the upper edge of the plate does not leave the bath, but is kept submerged; the bath solution in this case collects in small globules on the surface of the film, and, if only momentary, causes unequal action at these places, forming in the developed negative corresponding spots of different density.

The plate, on being taken from the bath, should present a uniform density when viewed by transmitted light, free from streaks and wave-markings in the film. In this respect, a plate that would make an excellent wet plate would, when converted into a dry one, be anything but satisfactory.

Handle the plate as little as possible, and always with filtering-paper between the fingers. In the washing, at first stages do not allow the water to wash from the fingers on the plate. The second dose of the preservative may be used for the first of the next plate. Do not get the solution of gallic acid stronger than three grains to the ounce; beyond this it becomes saturated, and is apt to form in crystals on the plate, causing spots. When the plates are drying, do not open the box or closet until they are completely dry.

The plates, if made with the above collodion, or with Anthony's yellow-label, will not require backing. On this point I can refer to our respected president, who, in the course of his experience with this process, gave an exposure of twenty-eight minutes, with the second stop of a rapid-rectilinear lens, to a view on the Schuylkill River, in which the distance was about twelve miles, and in the foreground white tombstones. The line between the sky and the distant objects is sharply defined, and the detail in the tombstones perfect, without the slightest particle of solarization. This plate was not backed.

The above will also serve as an illustration of the latitude in exposure these plates will allow of. The keeping qualities before exposure I have tested to the extent of one year, and the result was satisfactory. After exposure I have not had occasion to keep them over six weeks; but in this time there did not seem to be any difference in the development. I have never lost a plate by the film shipping. As for freedom from markings and spots in the film, the accompanying negatives will, I think, be found comparatively free from defects of this kind.

As to the exposure, from three to five minutes will be found sufficient, with a stop of about F. 25 on fairly-lighted subjects; but, as I have mentioned before, these plates will allow of great latitude in this respect, and more time can be given without injury to the high lights.

Development.—Wet the plate under the tap, and flow with a plain solution of pyro. (three grains to the ounce of water; allow this to remain on about a minute; if during this time the sky and high lights appear, continue with it (in cold weather warming the solution) until it brings up nearly all the detail; then add two drops of a citrate of silver solution, ten grains of nitrate of silver, and twenty grains of citric acid to the ounce. Keep this on until all the image is out, then add from six to ten drops more of the citrate of silver, which will bring up the density required. On the other hand, if there is no indication of the image in the first treatment with the plain pyro, pour off and add to it eight drops of a twenty-four grain solution of bromide of potash, and six drops of a saturated solution of carb. ammonia, and flow on after mixing by stirring. This will, in most cases, bring up the image; if not, a few more drops of the carbonate solution may be added. When the detail in the shadows begin to appear, wash off this developer well, and proceed with the pyro and silver as above. Fix in a strong solution of hypo.

You will see from the foregoing that, after all, this is but a modification of the Fothergill process. The application of the gallic acid confers the keeping qualities to the plates, makes, I think, a cleaner negative, and one more easily developed than without it. If the plates are

* Continued from page 268.

to be used within a week or ten days, the gallic acid wash may be omitted, with a gain, in sensitiveness, of about fifty per cent. to the plates, and then becomes the Fothergill process.

In conclusion, I may say that albumen, as far as my experience goes, is the main prop and stay of successful dry-plate work, whether used alone, as in the Taupenot process, or as a preservative to a washed collodion film; and if fairly tried, it will demonstrate for itself a peculiar fitness for photographic use not found in any other substance.

A FEW WORDS UPON MICRO-PHOTOGRAPHY.

BY M. A. RUTOT.*

VERY few have till now occupied themselves with micro-photography, notwithstanding the magnificent results which microscopists have obtained, and the obvious utility of productions of this kind. This abstention is due either to ignorance of photographic manipulations, or to an exaggerated fear of the difficulties which present themselves. Nevertheless, the difficulties are far from being so insurmountable as is generally believed, and in proof thereof I present to the Society some micro-photographs of various kinds obtained in a very simple way by M. Hempel, member of the Belgian Photographic Association. I may remark, in the first place, that the examples are far from representing the best examples which M. Hempel has obtained; on the contrary, they are the first essays made by an amateur which I place before your eyes. With a little more experience of photographic operations much better clichés will be obtained, I have no doubt, than those which are now laid before you.

The manner of operating is as follows. In any department into which the morning sun enters M. Hempel places his microscope upon a table. The instrument he employs is simply a small one of Hartnack's construction, upright, and bereft of its eyepiece. Above the microscope is fitted vertically, by the aid of a support, an ordinary camera (quarter-plate) capable of taking pictures nine by twelve centimetres, furnished with a focussing glass. The camera is in connection with the microscope by means of a little cone of black cloth, fixed to the photographic apparatus by the metal rim (where the lens fits in) and to the microscope by means of a rubber washer.

The object is put under the microscope in its proper place upon the object stand, and the sun's rays are directed upon it in the usual way by a mirror. The operator looks upon the focussing screen of the camera, and then, by the aid of the screw of the microscope, the enlarged image is focussed. If the image appears too small, it may be enlarged by gradually elongating the body of the camera; or if too big, the reverse operation is performed.

Having determined the size of the image, a diaphragm of very small aperture (about a quarter of a millimetre) is placed under the object, and a slight turn of the screw then furnishes the requisite amount of sharpness; the object may then be said to be focussed. In micro-photography the focussing should be rigorously exact, and a strong magnifier must be employed to view the image upon the ground glass; and to be able to judge the better of the half-tones, the operator should surround his head with a black cloth, to keep away the light. The focus properly adjusted, the operation of photographing may be commenced.

Before going any further, I may here call attention to a grave difficulty which may possibly occur: it is possible that the image may be perfectly sharp upon the ground glass, and yet when the collodion film is substituted there is a lack of sharpness and detail. In this case the operator has to do with a lens in which the chemical focus does not

coincide with its optical focus. Nevertheless, the evil is not an irreparable one, and a series of experiments properly undertaken will soon show how much the screw of the microscope should be turned to yield a good result. I may, however, state that I am convinced that defective lenses of this kind are much less frequently met with than is supposed to be the case, and good achromatic lenses always give good images. At the same time, in the case of colourless objects, or such as are of a monotone, like the diatoms, polycystines, and a large number of other organisms, the employment of very achromatic lenses is not indispensable.

In support of what I have just advanced, I may mention that the microscope which M. Hempel makes use of was not chosen for any special purpose, and gives with each of its true lenses pictures which have not the least trace of chemical defect.

The image of the object having been focussed, the latter is covered with a small piece of black cardboard: the ground glass is removed, and there is substituted for it the dark slide with the prepared plate. The slide is withdrawn, and by stooping down it is easy to direct upon the diaphragm the little luminous circle formed by the concentration of solar rays by the mirror; then, without loss of time, the piece of cardboard is removed from the object for a short time, and again replaced without hesitation. This brief period suffices to impress an image upon the collodion film; the dark slide is drawn, and the plate carried into the dark room to be developed, washed, and intensified if necessary, and finally fixed. From this negative may now be printed an indefinite number of positive prints.

So far as concerns the disposition of the apparatus, I would remark that I do not recommend the vertical arrangement which M. Hempel is compelled to have recourse to because his microscope is a vertical one. It is better to work with an inclined microscope, which allows one to place the camera in a horizontal position, by which means all the operations are considerably facilitated, and the whole affair assumes a proper stability.

In regard to objects to be reproduced in the micro-camera, two points have to be considered: their thickness and colour. As in the case of looking at an object under the microscope, the difficulty is to focus an object in every part, for some portions are sharp, while others are blurred, from the fact that they are not all in the same plane. Nevertheless, the photographic process offers many resources, and it is possible to obtain very extensive enlargements even with very feeble lenses. To do this, the exposure in the camera should be lengthened, the object, whether opaque or transparent, being always well lighted.

So far as regards colour, it is well known that certain of them—such as yellow, red, and green—do not reproduce themselves in photography according to their intensity, and that the prints appear with much darker tones than the originals appear to the eye. In cases where the objects present non-photogenic tints, they should be very powerfully illuminated, but with a very small diaphragm, polarised light being employed with advantage. Many organic substances of brown and yellow colour may have their tints reversed, or their outline lighted upon a black ground, by using polarised light.

The photographic process employed in micro-photography should be a very rapid one, and for this reason wet plates are the best; but now that dry-collodion processes, and especially the so-called emulsion methods, have been so much improved in England, these should be particularly applicable to micro-photography. By employing such a process, the operator might prepare in advance a whole series of plates, and these he would have merely to slip into the microscope one after another in order to secure twenty, thirty, or as many even as fifty photographs of different subjects in one morning.

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THE NEXT PHOTOGRAPHIC EXHIBITION.

PHOTOGRAPHERS who contemplate contributing to the next exhibition of the Photographic Society will be glad to know that the date and other preliminary arrangements have been decided, and that the date at which the exhibition will open will give time for the most satisfactory preparation of specimens. The errors of judgment which led to failure last year will, on this occasion, be avoided, and the contemplated plans will afford every facility for a highly successful exhibition, which we hope photographers generally will do their part in securing. The exhibition last year was opened in the first week in September, a time when, unfortunately, a great many people were out of town—thus necessarily limiting the number of visitors—and a time, as many of the usual contributors declared, inconveniently early for photographers to prepare and send in pictures. The exhibition will this year open a month later; opening on the evening of Tuesday, the ninth of October, and continuing open until the middle of the following month. The exhibition will open with a soiree; but the stumbling-block of last year, the enforcement of evening dress, will this year be avoided, and the adoption of morning dress invited.

There will be this year also another powerful incentive to extensive contribution of high class pictures. The Council have resolved again to try the experiment of offering medals for various forms of excellence, artistic and technical. The value of awards of honour, as stimulating effort and securing the highest excellence, has been pretty generally acknowledged, although the wisdom of such awards in relation to works of art has often been disputed. In an art-science like photography, however, we think the arguments against offering medals for the best results in works of art can scarcely be sustained. The best argument against the distribution of medals in connection with exhibitions of photographs is that based upon experience, which points out that much heart-burning and discontent generally follow upon the awards. The last award of medals by the Photographic Society of London was followed by a painful disruption in the Society, which was by many attributed largely to the action of disappointed competitors at the Exhibition. We do not think, however, the disruption was due to such cause, nor do we think there is reason to fear any such injurious results in conjunction with the coming competition. Details of the forms of merit for which medals will be offered will appear in due time; but we may state that almost every possible form of skill, technical and artistic, is offered an incentive to do its best in the list of medals to be offered by the Society. Between twenty and thirty medals will be distributed; they will all be of bronze, and of equal value, although the record attached to each will necessarily modify the degrees of honour

conferred. The competition will of course be open to all photographers, whether members of the Society or not, and the concours of foreign photographers will be greeted with especial satisfaction.

Referring to the possible, or rather the inevitable, disappointments felt by non-successful competitors, the Council have determined upon a modification in appointing the jury of award, which, if it fail to secure universal satisfaction, will, at least, we think, be beyond challenge. Instead of selecting the jury as heretofore from members of the Council, it will on this occasion have a mixed constitution. It will consist of seven gentlemen, two of whom have been selected from the Council, two from non-official members of the Society, two from the art world: a Royal Academician and a member of the Society of Water Colours being requested to act, and the President of the Society as *ex officio* chairman. A jury so composed can scarcely fail to arrive at an accurate judgment of merit, and there cannot be a doubt that they will give decisions untingered by any motive but their conviction of the merit of the contributions. We hope that photographers generally will contribute, and that the exhibition may prove the best which has ever been held.

PHOTOGRAPHY AT THE ROYAL OBSERVATORY.

THE annual report of the Astronomer-Royal, Sir G. B. Airy, to the Board of Visitors was presented on Saturday week, at the Royal Observatory, Greenwich. Even a casual reader, glancing over the summary of this report, cannot fail to be struck with the employment now made of photography in connection with the records made at the Observatory, for, both in connection with the sun and with the stars, as also in respect to barometrical results, the camera seems to be in daily and nightly requisition. The Astronomer-Royal began by alluding to the Transit of Venus observations, and many of his audience were, no doubt, anticipating that something would be said about the completion of the results with which the Greenwich Observatory authorities have been occupied so long. But beyond mentioning the fact that all instruments lent had now been returned or made good, Sir George Airy did not vouchsafe a word upon the subject.

A better proof of the increased interest shown in the matter of photo-astronomy could not be afforded than the circumstance of there being at the present moment four photo-heliographs at different stations under Government supervision; namely, at Greenwich, at Chatham, at South Kensington, and at the Cape. The instrument at South Kensington, the Astronomer-Royal informs us, is "accompanied with equatorial transit, altazimuth, clocks, micrometer, &c., with appropriate huts, and chymical rooms, forming a complete representation of a first-class establishment for observation." There is another photo-astronomical station at Kew, where daily pictures of the sun are taken, so that a very complete solar record should be forthcoming. A word, however, may be said on this point, we think. It has been recently proved by photo-astronomical observations taken in the Engadine, a station at 6,000 feet above the level of the sea, where the air is of the purest and clearest, that far better and more trustworthy images are secured than can be secured on the plains in the midst of vapours, or in the neighbourhood of smoky towns. M. Janssen, whose observatory at Meudon is much further from Paris than Greenwich or South Kensington are from the centre of the metropolis, has already complained that his photographs suffer from the proximity of the capital; and we may be quite sure that if a wood-burning city like Paris interferes with the clearness and detail of astronomical photographs, London, which is twice as big, and ten times as dirty, by reason of the coal that is burnt within its limits, must have a very marked prejudicial influence.

The Astronomer-Royal informs us that "photographs of the sun had been taken on 140 days, of which 239 have been preserved, the photographs showing a complete absence of spots on 57 days, and on 29 of these there were neither spots nor faculæ." And here we come to another point of importance, which proves how necessary it is that the aspect of the sun should be daily registered. M. Janssen remarked on a solar photograph taken on the 15th April last a distinct record of a sun spot, while the picture taken by him the day before—that is, on the 14th—betrayed no trace of any such phenomenon. The inference, therefore, is that sun-spots may appear very suddenly, and do not develop as most astronomers have hitherto appeared to think. Should this turn out to be the case from further observation it will, indeed, lead most likely to a modification of the accepted theory respecting them. Already M. Janssen's observations have been attacked, and one astronomer has publicly enlarged against M. Janssen's views, asserting that M. Janssen is altogether in the wrong in bringing forward such a theory, as being against all the evidence hitherto adduced. But M. Janssen, in reply, simply points to his photographs; he brings forward no theory, but a fact which, as he says, any one can verify by looking at the photographs for himself. A more important proof how necessary it is we should have daily record of the solar disk could not be forthcoming, and when carefully secured, it is perfectly useless to set up ordinary ocular observations against them.

Sir George Airy in his report further alludes to the measures taken at Greenwich to secure by photography a record of the magnetic pulsations of the earth, and also of the barometric readers. In reference to the latter he says:—"The computation of the photographic records of the barometers from 1854 to 1873 has so far advanced that it is asserted positively there is no trace of lunar tide in the atmosphere, but that there is a strongly-marked semi-diurnal tide, accompanied with a smaller diurnal tide." There seems to have been no effect made as yet at Greenwich to add to our meteorological knowledge by securing cloud photographs, as recently suggested by Dr. Piazz Smyth, the Astronomer-Royal for Scotland.

EXPERIMENTS WITH THE CHARDON DRY PROCESS.

BY M. ANDRÉ.*

ENCOURAGED by the remarkable results obtained by M. Chardon, I have recently resumed my study of emulsion processes, of which I made a trial two years ago with but little success. I always think that the mutual account of our labours is interesting one to another, and I therefore take the opportunity of communicating what I have recently done in the way of experiment. I have kept scrupulously to the formulæ given by M. Chardon, if I have not altogether taken the same proportions of pyroxyline. As to the manipulations, I have followed in his wake, only making modifications where experience has suggested the same to me.

My first experiment was made with collodion made with equal parts of resistant and pulverulent pyroxyline. The sensitisation was brought about with 3·10 grammes of nitrate of silver for every 100 of mixed collodion, and seemed to answer well; but I lost a portion of the silver salts in dissolving it. After thirty-six hours, an analysis of the washing water gave me no appreciable trace of silver in excess, nor of bromide. By a singular chance, I had arrived at almost mathematical precision. I nevertheless chloridised my emulsion, and precipitated it forthwith. Dried and redissolved with an addition of quinine, and poured upon glass plates, it yielded a film of considerable opacity, and of a matt appearance; as I foresaw, the result was but mediocre. I obtained but flat and finely granulated plates, and in-

capable of being intensified, at least by alkaline development alone. I have the honour of submitting to the Society two examples of this first essay, which, I will frankly admit, are bad. I attributed my non-success to the collodion containing too large a proportion of pulverulent cotton. I again set to work, augmenting by one-third the resistant pyroxyline, and diminishing in the same proportion that of the pulverulent gun-cotton. This time I sensitized with 3·15 grammes of nitrate of silver, and on analysis I had the satisfaction of discovering a slight excess of silver salt. I believe that 3·10 grammes, or even 3·05, are sufficient, but on condition that not an atom of silver is lost in the operation of dissolution. After having neutralized the excess of silver by chloride of cobalt collodion, and otherwise followed M. Chardon's directions, I covered my glass plates, the film presenting a very different appearance to that of my first essay.* The film was rather less opaque, not in the least granulated, even when seen through a magnifier, and of a brilliant character. The result appeared to me very satisfactory. I have the honour to submit a dozen clichés taken with this emulsion, and I may remark that the time of exposure was exceedingly short, namely, from three to ten seconds for portraits in the open air (a doublet lens), and from thirty to sixty seconds in the case of views. I estimated that this was scarcely double that required in the case of wet plates.

In a third essay which I made with the emulsion, I wanted to bring about the sensitisation of the bromised collodion in a different manner, in order both to prevent any loss of nitrate of silver, and to accelerate the operation. I dissolved the desired quantity of silver with a few drops of alcohol and water in a litre bottle, taking care to place the same so that the bottom of it stood in a receptacle of hot water. As soon as the solution of the silver had been completed, and before the liquid had perfectly cooled again (to 30° to 35° C.), I poured—only taking care not to lose any of it—the bromised collodion into the solution of silver. At first I thought that the emulsion had failed, but after a few hours it was complete. The clots which had formed at first soon redissolved, and the plates, which I then prepared with the product (which had undergone all the proper operations), appeared to me as good in every way as those secured in the manner previously described. I am far from saying that this method of operating is new, but it is an appreciable simplification.

Finally, a little while ago I came upon the idea of precipitating the emulsion, not with cold water, but by means of hot distilled water of a temperature sufficient to boil, during a few moments, the emulsion poured into it. This time the product, as I foresaw, was much more voluminous, and in some degree of a flocculent nature, a condition very favourable to its dissolution. At the same time I noticed a circumstance which at first I could hardly believe—namely, that the water of precipitation and the rinsing waters were much less charged than heretofore with the white powder, which is composed in great measure of bromide of silver. However this may be, the spongy mass, when dried and redissolved, gave me an excellent film of a very resistant and remarkable character. I can hardly say as yet whether this mode of precipitation is really preferable to the other, but I can assure my readers that it gives excellent results, and that in this way the emulsion is perfectly washed. For my own part, I find it simplifies the operation a good deal, it being thus performed in a few minutes; but care must be taken to operate at a good distance from any light or source of heat, since the quantity of ether vapour given off in the operation might otherwise cause explosion and damage. I took the precaution, when carrying out the operation, to do it at night and in the open air. I exhibit to the members a series of four negatives taken with emulsion prepared warm in this way.

I have only, in conclusion, to express the desire, which I

* Read before the French Photographic Society.

* For complete details of M. Chardon's process see p. 226.

know is felt by all the members, that all who experiment with M. Chardon's beautiful process will, as I have done, give some account of their work, so that we may become well acquainted not only with the conditions of success, but also those of failure. In making known experiences in this way, whatever their nature may be, we shall soon be able to introduce a bromide of silver emulsion into every-day use, and employ it with more certainty even than is the case with wet plates.

THE PHOTOGRAPHIC PRINTING PROCESSES, WITH PARTICULAR REFERENCE TO THE AUBEL PRINTING PROCESS

BY G. BAUMANN.

ALTHOUGH it was reserved for the last decade to bring the photographic printing processes to a rather high degree of perfection, the effort to make photography in this direction useful and profitable is almost as old as our young art itself. Many able men have undertaken the solution of this problem, and, as a consequence thereof, having produced more or less favourable results, I think it important enough to give a compilation of the different methods employed. Before I do this it will be necessary to classify them, those where a print can be made from the original plate forming one class, while those where this is not the case form a class of themselves. We have, therefore, two classes, one comprising the *direct* method, the other the *indirect* method.

To the direct method belong—

1. Fizeau's heliographic process. 2. The Aubel process.

To the indirect method pertain—

1. The different asphaltum processes. 2. Lichtdruck. 3 and 4. Relief print and Talbot's steel-print process. 5 and 6. Photo-lithography and photo-sincography. 7. The heliographic processes.

The indirect processes having been, so far, more generally used, we will begin with them:

1. *Asphaltum Processes*.—If a proper solution of asphaltum (i. e., asphaltum dissolved in oil of lavender, ether, or chloroform) is poured upon a metallic plate or stone in a dark place, and the surface, dried in the dark, is exposed to light under a negative, the parts touched by the light will become insoluble; if the particles remaining soluble are now removed with benzine or oil of lavender, the underlying surface will be exposed, and the possibility is offered to let acid operate upon the thus exposed parts of this surface. In this way an engraved plate is produced which is suitable for printing.

Nicéphore Niépce made his first experiments in this way to obtain a picture in the camera, but he seems to have had no success with it. At some later time he tried to make steel prints with it. His nephew, Niépce de St. Victor, however, was the first successful one to complete this method. The last named exposed an asphalted steel plate under a positive, dissolved the unchanged particles with benzine, and etched the remaining parts with acid.

Negré exposes to light a steel plate under a negative, gilds, in the galvano-plastic manner, those parts exposed by washing with benzine, cleans the asphaltum entirely from the plate, and etches it with acid, the parts not gilded only being touched. One of the heliographic methods (that of Baldus) is also partly based upon the properties of asphaltum, as we will see afterwards.

2. *Lichtdruck (Light Printing)*.—If a coating of glue soaked with chromate of potassium is exposed to light under a negative, amongst other properties obtained after treating the coating with warm water will be the one upon which lichtdruck is based—that is, to receive only and fasten upon the lighted parts, correspondingly with the lighting, more or less ink. If now the coating, impregnated with printing ink and covered with clean paper, is put through a proper press with a slight pressure, the ink—that is, the picture—is transferred completely upon the paper. This method comes from Albert in Muni-

was practised about the same time by Obernetter and Gemoser. Presuming that the details of this method are sufficiently known, I restrict myself to this brief notice.

3 and 4. *Relief Printing and Fox Talbot's Steel Printing Process*.—Chrome gelatine plays again the principal part in these processes, but this time another property of it being used—by light to become indissoluble in warm water. If, therefore, a lighted chrome gelatine coating be treated with hot water, those parts that have become insoluble by lighting remain, whereas the soluble, unlighted parts are dissolved, and the coating does not now appear smooth, but is more or less etched. This etched surface was used by Woodbury, the inventor of the relief or Woodbury print, as a mould, to make by means of a hydraulic press a copy in metal. A thin coating of warm pigment (a mixture of colouring matter and gelatine) is poured upon this metal plate, and a sheet of paper pressed upon it lightly. The ink adheres to the paper, stiffens at once, and the picture with all its half-tones is completed. With any other ink no half-tone can be obtained, because the gelatine ink has solely the property to look lighter in thin coatings than in heavy ones. The results obtained in this manner are quite excellent.

Fox Talbot exposes a steel plate covered with chrome gelatine under a positive, having dissolved the unlighted parts with warm water; etches the exposed parts of the steel plate with acid, chloride of iron, or chloride of platinum; and obtains in this manner a deeply-etched drawing of the same.

5 and 6. *Photo-lithography and Photo-zincography*.—Niépce had already tried to transfer the photograph on stone, and created, by means of the asphaltum process, a picture upon it, and etched the same into the stone. Poitevin coats a stone with chrome-gelatine, because the ink will then stick to the lighted parts. Others make, by the last method, first a picture upon paper, transferring the paper picture, which has been inked, afterwards upon stone, which, by this manipulation, will be adapted for printing.

To obtain a sincograph, a picture is pressed upon zinc in the last-named manner, and etched, first with very dilute acid, and afterwards several times with a stronger solution. To prevent the raised parts from being corroded by the action of acid, care is taken to put powdered resin on them, and then heating the plate just sufficiently to melt the resin. The resin will run over the edges, and protect the sides in such a way that the raised parts remain broader towards the lower side.

7. *The Heliographic Process*.—The object of heliography is to get a printable copper plate. If the plate has been obtained, by a precipitate of copper, from a copper solution in the galvano-plastic method, the plates may also be called galvanic. An etched copper plate is obtained in a simple manner by coating it in the dark with chrome gelatine, and exposing it to light under a positive or negative. After the picture has been developed with water, the parts not lighted will be etched by a solution of chloride of iron. A relief picture is obtained, if a positive is used for lighting, and an intaglio one by using a negative.

Pretsch and Poitevin spread upon a glass plate a mixture of chrome gelatine and iodide of silver, and expose the same under a positive. After developing with warm water an uneven surface (coating) remains, which is filled up with a solution of gutta-percha. When dry, it is removed carefully from the gelatine coating, and the gutta-percha mould, covered with graphite, serves now for the production of a galvano-plastic copper plate.

Baldus uses an asphaltum coating on copper, and exposes the same under a positive. After developing with oil of lavender, the plate remains for a few days under the light, to be exposed afterwards, in a trough with a solution of sulphate of copper, to the influence of a battery. A relief or intaglio picture is formed according to the plate hanging on the negative or positive pole; and while in the first case the copper is deposited wherever the plate is freed from asphal-

tum, in the other case the copper is eroded. Scamoni, whose heliographs belong to the best productions of this kind, prepares his plates in the following manner:—Of the negative to be reproduced he makes a positive silver picture on plate-glass, and strengthens it well with a silver and pyrogallie acid solution. The plate, washed with water containing some ammonia, is after this strengthened with bichloride of mercury, and afterwards with a chloride of gold solution. After this, he strengthens the plate with water containing iron and pyrogallie acid, and dries the same over a lamp. Through this strengthening process the coating has been rendered well in relief, and is in condition to have a good printable copper cliché made from it by the galvano-plastic process. For this purpose a thin varnish is flowed over it, on which, before it is entirely dry, a little powdered graphite is thrown, to give the coating the necessary preparation for the conductor. The plate is now placed into the galvanic bath, and left in until the copper precipitate has the necessary strength. If the copper plate is now carefully separated from the silver coating, nothing remains to be done but to clean and block the copper plate to use it for printing purposes.

Herewith the indirect methods are concluded, and only the direct methods left for discussion. One of them,

Fizeau's Heliography, has been of but little value, for the plates produced could stand only a few prints; but it is deserving notice, because the experiments which Fizeau and others made with it date back at least thirty years. The idea was to get a printable plate by treating a Daguerreotype with diluted acid.

More important than this method is the latest of all—

The Aubel Method.—If liquid or gaseous fluoric acid is left to act upon glass, the acid dissolves the surface of the glass plate to a considerable degree; but while the liquid acid leaves the surface even and transparent, the vapours make the affected parts matt. If liquid fluoric acid is put upon a common varnished silver negative (an unvarnished coating tears too easily), and is left to act upon the same for a few minutes, it will be found, after entirely washing off the silver coating and drying the plate, that the picture, although weak, is completely etched upon the plate. A relief picture has been produced with those parts protected by the silver not affected, or very little, while the unprotected parts have been etched considerably more. If the attempt is made to rub lithographic ink upon such a plate, which appears to be etched deep enough, it will be found that the ink does not stick. If you let fluoric acid set upon an unvarnished, clear negative, strengthened with silver and pyrogallie acid solution, it will be found that a picture has been formed just as before, only with the difference that the affected parts are matt. If, now, lithographic ink is rubbed upon such a matt etched picture, it will be found that the ink adheres, and that it is possible to print the same as on paper. Still those experiments are not always successful, for the reason that the collodion film is apt to tear before the picture is etched deep enough, a consequence of which is that the acid acts over the entire plate. To prevent this, Aubel precipitates, by the galvano-plastic process, a little more silver on a pretty strong negative fixed with cyanide of potassium. The coating becomes so consistent by this manipulation that it will stand the following operation of etching with fluoric acid gas. After the gas has taken effect sufficiently, the silver coating is washed off, and the plate dried and put upon a lithographic press for printing, where it is fastened upon a lithographic stone. The lithographic colour is put on with a ball, and is a very difficult manipulation, as is also the printing. For that reason the first good and satisfactory print is transferred upon metal or stone by the well-known process, and from these the prints are made.

The entire process is a very difficult one, and claims a great deal of attention, the plates being of no use if they are etched too much or not enough, and will take too much or too little ink. A cleanly-etched plate-glass negative

looks charming, but it is advisable, on account of the danger of fluoric acid, that only those should busy themselves with etching who are conversant with it.

As seen from the above process, the results obtained must correspond exactly to the negative, with reference to the position of the several lines, for which reason the process is adapted to the reproduction of line drawings, &c. Half-tones cannot be produced, which explains why Aubel prints appear so hard and dry in comparison to the reproduced original. It may be that by the use of gelatine ink better results will be obtained.

In conclusion, I will remark that of all cited methods for the reproduction of half-tones, two only are suitable, the Lichtdruck process and the Woodbury process; all others give no half-tones.—*Photographische Monats Blätter.*

Correspondence.

CURIOUS SPECTROSCOPIC DISCOVERY.

SIR,—Most persons have become acquainted with a simple and readily-constructed apparatus by means of which drawings, portraits, or plans may be very closely copied. It consists, in its most primitive form, merely of an upright sheet of glass supported transversely, or affixed in a groove upon a flat surface. When it is in use, the drawing which the student proposes to reproduce is placed upon the board lying immediately before him. Then looking from left to right, the eye rests upon the glass, in which is seen mirrored an exact image of the thing to be drawn—imprinted, apparently, upon the blank sheet, which lies at the student's right hand. By this means he is enabled to obtain an accurate tracing of the portrait or sketch. Now, it will be evident that when the apparatus is efficiently constructed, this duplicate copy of the drawing can be withdrawn for examination at any stage of the work, and may be afterwards carefully replaced and proceeded with. So, too, it will be equally evident, that in the instance of copying a *portrait*, the substitution of any other face than the original one would be attended by a falsification of the image and a consequent destruction of the true identity. At this point, then, the reader may be requested to surmise for himself the arrangements that have been devised for communicating to the image, as presented in the mirror, the utmost possible degree of vividness, and for efficaciously utilizing the apparatus as an agent of judicial identification.

These details consist, in the main, of certain accessories for directing a powerful concentration of light upon the portrait with the employment of a mirror-plate of superior quality and of an especial tint. Thus furnished, it is next necessary that two life-size photographs shall be so arranged under the light, and on the reverse sides of the mirror-screen, that the vividly-illuminated features of the one shall be perfectly imaged at the precise angle and point of sight where the other appears. All being satisfactory, an entire novelty awaits the investigator. For, in the event of the photographs being those of the *same person*, and the attitude corresponding, then, at the *precise moment when perfect unison is reached*, one single image starts suddenly in existence, with all of those statuesque effects hitherto deemed peculiar to the stereoscope, and with all the vivid realism of life itself! Let me add that the *exterior changes* produced by lapse of time do not interfere with these results, though the deepened shadows and the "crow's-feet" are duly brought into view. It will suffice to say that I have not here specified all the paraphernalia requisite to bring about these effects in their most brilliant form; but the general principle will be sufficiently obvious to the intelligent reader.

I conclude by observing that I have placed into this apparatus—which, for lack of any better term, I designate an "identiscope"—certain life-size photographs, being on the one hand those of "young Roger Tichborne," and on

the other those of the "Tichborne Claimant." Doubtless I shall be expected to state the result of a test so conclusive; but, though the reply may be given with the utmost certainty, it is a disclosure which I do not here deem it needful to insert on merely my own unsupported authority.

W. MATHEWS.

SALVAGE COLLODION.

SIR,—Another case of collodion has been picked up off this town on Tuesday last, the 5th instant. It consisted of twenty bottles of Mawson's collodion, with twenty bottles of iodiser to make up the pints. It was enclosed in a tin case soldered down securely. It has either been thrown overboard, or may have been part of the cargo of some vessel which has undoubtedly foundered off here, as a large quantity of wreck-timber and ship's stores have been washed ashore near here. The case of collodion which was picked up near here some time back was ascertained to have been made by Mawson and Co. for another firm, who shipped it in bond, but who refuse to redeem it now. No purchaser has been found for it, though any price over three shillings a bottle (which is the duty) would purchase it. In that case there were forty-three pints, without iodiser; in this one there are twenty pints, with iodiser.

It is somewhat singular that such unusual salvage should in both cases have come ashore at the same place.—I am, sir, yours truly,

J. WALTER.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE last meeting of the present session of the Society was held in the Water-Colour Gallery, Pall Mall, on the evening of Tuesday, the 12th instant, Mr. J. GLAISHER, F.R.S., in the chair.

The minutes of a previous meeting were read and confirmed.

The CHAIRMAN said that the Exhibition of the Society would be opened in that room on the 9th of October next. The Council of the Society had resolved to offer medals for various forms of excellence. The jury of award would consist of seven gentlemen: three from the Council, two from the body of the Society, and two gentlemen especially connected with the art.

Mr. SAWYER then read a paper on the continuation of the action set up by light on sensitive carbon tissue after the print has been withdrawn from the light. Mr. Sawyer exhibited a number of prints from negatives which ordinarily required an exposure of six tints. These had received one tint, and then were withdrawn from light. Each print had been cut into two portions, one half being put away in the dark and as much as possible preserved from moisture and atmosphere; whilst the other half had been placed away in the dark without any protection from the atmosphere. All the prints had been kept a certain number of hours before development, and the action set up by light had gone on in all, but much more palpably in those merely kept in the dark, but not sealed up from the action of the atmosphere.

Captain ABNEY wished that the gentlemen of the French Photographic Society who were so incredulous of this continuing action of light on carbon tissue could see the examples exhibited. He himself found an exposure of one tint with fourteen hours before development yield a print as fully done as if it had received four tints and immediate development. He was experimenting with the continuing effect of the yellow ray, and, indeed, of all rays; his experiments being carried out with the actual rays of the spectrum, not merely light through coloured glass. He hoped shortly to have something on the results obtained to bring before the Society.

After a vote of thanks the Secretary read a paper from Mr. Berkeley on emulsions.

Captain ABNEY read a note on the same subject, and the discussion was adjourned until a future meeting.

Mr. THOMAS read a brief note on the late silver bath discussion. He then exhibited a new lens by Voightlander, and showed examples of its work. He said that he had made it a point at all times to avoid bringing before the Society matters connected with his own trade manufactures; but he had not a similar scruple in bringing under the attention of members this last work of the great German optician. The lens was based on calculations made by Dr. Sommer. It was perfectly aplanatic, working with full

aperture, the relation of which to focus was one to six. It resembled the rapid rectilinear, but was of shorter focus. The examples he showed were produced with a twenty seconds' exposure. The price was low, and no discount was allowed, instead of fixing a high price and taking off a discount.

Mr. STUART (of Ross & Co.), as being himself connected with optical manufactures, rose to protest against the Society being made a vehicle for trade advertisements, for which the journals furnished a proper place. Mr. Thomas had shown nothing and stated nothing of a scientific character. He brought forward a lens like that of Mr. Dallmeyer, or that of his (Mr. Stuart's) own firm, and made statements about it which they had no means of testing. The twenty seconds he mentioned of exposure in Vienna might probably turn out to be one hundred and twenty in London. Then the allusion to prices was utterly unbecoming, and he protested strongly against the introduction of trade matters into the Society.

The CHAIRMAN said that but for Mr. Thomas' allusion to the question of price, he should have stopped the remarks he (Mr. Stuart) was making at once. He must request that the matter should drop.

Mr. THOMAS said there was a good precedent for introducing such matters to a Society in connection with this lens in the French Society, who had, when it was brought before them, appointed a committee to report upon it.

The CHAIRMAN called attention to some specimens of emulsion work shown by Mr. England, and then said the meeting would be adjourned until October 9th, when the Exhibition would be opened.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on the 7th inst. the President occupied the chair.

Mr. B. J. EDWARDS read a paper on the "Nitrate Bath" (see page 278).

Mr. BAKER said that he had purchased for two guineas from Mr. Edwards the improved method of treating a bath, but he had to confess total failure with it, even after trying almost every kind of collodion. He did not think that he obtained fifty negatives before the bath gave up and caused numerous pinholes. This continued, in spite of every care, until he added a quantity of nitrate of baryta to the bath, after which he had no more annoyance.

Mr. EDWARDS felt sure that Mr. Baker must have deviated from his instructions in some way or other, otherwise he would not have experienced trouble with his bath. He had now made public his process, as the time had passed during which he considered himself bound to keep it a secret.

Mr. YORK, upon being called on by the Chairman for his experience in negative baths, said that he had nothing to say beyond this, that he, at one time, had been very much annoyed by the behaviour of his bath; but since he had adopted the habit of adding to it nitrate of baryta it had given him no further trouble.

Mr. WARNERKE had been much interested in all that had been said at recent meetings of the Photographic Society of Great Britain respecting the cause of pinholes, but had heard nothing to warrant him in setting aside his own hypothesis that they were caused by fulminite of silver.

Mr. WILLIAM BROOKS had almost entirely laid aside the nitrate bath, as he preferred to use emulsions; but he had made his nitrate baths with plain water, and sunned them well before using.

Mr. E. W. FOXLER thought it a mistake to conclude that pinholes were produced only from one cause, because there were many. This evil had been more prevalent since the introduction of bromized collodion than when simply iodized collodion was used. He described his method of sunning a bath, and passing to the subject of surface markings on collodion negatives, attributed this defect to want of proper draining of the plate. He then showed in what manner, by means of a well bath, the plate might be drained for a protracted period without its surface becoming dried.

After some observations by Mr. Bridge,

Mr. FRANK HOWARD advocated the addition of a drop or two of water to a collodion which gave such markings.

A Member having introduced the subject of the filtering of baths, collodions, and emulsions,

Mr. WARNERKE spoke of the advantages of glass-wool as a filtering medium.

Mr. TAYLOR had used a fine sample of felt for this purpose with advantage.

Mr. BROOKS thought that tow would fulfil every requirement.

Mr. FRASSELL thought that while glass-wool would answer

quite well for collodion, it would be liable to be decomposed by aqueous solutions. He also considered that it was possible that a double salt of sulphate of silver might be formed in the collodion, to which pinholes and other defects might be attributable.

Mr. EDWARDS having made a few observations in reply, and having received the thanks of the meeting for his paper,

The CHAIRMAN then adjourned the meeting for the summer recess.

It was arranged that an out-door meeting of the Society be held at Hampton Court on August 1st, at which the members are requested to bring their friends.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in 5, St. Andrew Square, on the evening of Wednesday, the 6th inst., the President, Mr. LESSELLS, in the chair, when the minutes of the previous meeting were read and approved, and Messrs. J. M. Laren, J. Ballantyne, Jun., S. Wellstood, W. Porteous, and J. Morton, were admitted ordinary members.

The SECRETARY read a paper by Mr. Low, on a "Few Experiences in the Studio" (see page 279), and handed round several fine prints as examples produced in the ordinary course of business.

Mr. NORMAN MACBETH quite agreed with Mr. Low in his statement regarding the quantity of light that should be admitted into the studio, and thought that as a general rule photographers used too much, or too much diffused. To this cause was due the fact that in many cases it was difficult, in examining a portrait, to discover the source of light. With diffused light the photographer could never produce pictorial effect, and as a rule the less that was employed, if properly concentrated and directed, the better would the results be. One difference between an ordinary photograph and a work of art lay in the absence, in the former, of this poetry of art and sentiment, neither of which could be attained unless by a properly concentrated and directed light. Mr. Low, he thought, was equally right in avoiding intensification of the negative as far as possible. Photographs in common with paintings, contained, or ought to contain, first, high lights; then half lights, which was the region of colour; then middle tint, which was the beginning of shadow; and shadow. The "pearly tint" is the region of colour, and wherever much intensification has been resorted to, that is lost, and with it much of the charm that the picture ought to possess.

Dr. THOMPSON thought the remarks about the use of only a small quantity of developing solution of much practical importance. No doubt considerable dexterity was required, in the use of only a little developer, to get the surface of the plate evenly and rapidly coated, and so prevent unequal development; but the results were well worth the practice necessary to enable the operator to do it properly. The resulting negatives were much finer, and there never was any necessity for after-intensification.

Mr. BASHFORD said that Mr. Low's experiences were very similar to his own. He thought the key to the highest class work would be found in casting aside all ideas regarding the doctoring of the bath. He did not believe that really high class work could be made with a doctored bath, and under that appellation he included filtering. Years of experience had convinced him that whenever the bath gave evidence of being out of order, it should be thrown down, and recourse had to a new one.

Mr. YERBURY could corroborate Mr. Low's observations regarding the advantage of keeping the plates for a considerable time between sensitizing and exposure; he generally had a few ready, and found that when kept in a box they wrought very well after a period of at least two hours, and developed quite free from stains or markings of any kind.

Mr. DOBBS, in moving a vote of thanks to Mr. Low, said that the author of the paper had been too modest in his title. Instead of a few experiences, the paper really consisted of the valuable experience of a most careful and successful operator of many years standing.

A number of the pictures taken at the late out-door meeting at Bothwell Castle were submitted for inspection by Messrs. Mathison, Orighton, Turnbull, &c., and elicited a good deal of discussion, and some of them much admiration. In reply to the President,

Mr. MATHISON said that, with one exception, all the plates exposed at Bothwell were by the collodio-bromide emulsion, and of nearly similar quality—that is, containing just a mere trace of free bromide, and with a preservative of simple bitter beer. To this latter fact might be due the fact that long exposures were required, or, at least, that long exposures seem to give the best results. In his own case he had given from thirty to forty minutes, and members had an oppor-

tunity, by the examination of some of the prints on the table, of seeing whether he had given too much. The development was conducted by first moistening the plate with water, then flooding with a saturated solution of carbonate of ammonia to which had been added a few drops of an alcoholic solution of pyrogallallic acid. By keeping the pyrogallallic acid well down, the image came up at first thin and delicate, and readily acquired density on the addition, from time to time, of a few more drops of the alcoholic solution. As a rule, the restraining action of a bromide was not required; but should the development appear to be proceeding too rapidly, he added a little, which kept it within bounds. As a guide to beginners in the development of those plates, he might say that on an average the process in his hands occupied about ten minutes.

Mr. BASHFORD, until quite recently, had given little attention to dry plate work; but he had got initiated into the mystery by Mr. Mathison, and could bear out his statements regarding the facility of working the kind of emulsion in question. He had been trying it for enlarging, and found it to possess several advantages over the process he had been in the habit of using. It was simpler, not liable to stains or markings, and developed quite as quickly as did a wet plate, while any required density could be readily obtained. His first experiments were made with emulsion kindly supplied by Mr. Mathison, and not liking to ask for what he was not allowed to pay, he had obtained a supply of a commercial article, but found it required a much shorter exposure than that which he had been using; in fact, it was too quick for his purpose; but a wash with bitter beer was found to make it slow enough.

Dr. THOMPSON said that in dry-plate work generally, and especially in emulsion work, each operator succeeded best with his own preparation, or with that with which he was best acquainted, as he knew how to prevent a fault, or where to find a remedy. It was to him a matter of surprise that professional photographers had not long ago adopted an emulsion process for this portrait work. There were many advantages that would arise from being able to prepare a supply of sensitized plates for the day, and he believed, from his own experience in another direction, that if a plate were coated with emulsion and placed in water, it would keep for any reasonable time, and be quite as sensitive as ordinary wet collodion. Those who tried to coat a plate with emulsion for the first time might find some difficulty in getting a smooth uniform film. With ordinary collodion the plate might, in pouring off, be raised to the perpendicular without injury; but in the case of an emulsion it should be tilted off the level only enough to cause the superfluous quantity to flow into the bottle.

Mr. PRINGLE said that until the Cadsow Forest trip he had little or no acquaintance with dry-plate work, but must confess to a liking for greater rapidity than could be got with the emulsion under discussion. He procured some uranium plates, and, according to instructions, exposed from thirty seconds to a minute. He did not very well know how to set about the development, but Dr. Nicol happened to call, and from information got from him, he succeeded perfectly at the first trial, and managed to get a number of really excellent negatives.

Dr. NICOL then read a report from the late Exhibition Committee to the Council, and the meeting was adjourned.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

ON Wednesday, the 6th of June, the members and friends of the above Society availed themselves of their first monthly excursion for the season, to visit the Ryburne Valley. Proceeding by waggone from the Sowerby Bridge station, the party were conveyed up the valley; many of the excursionists alighted at Slitheroe Bridge, and proceeded by the stream up the valley, the scenery of which is something grand. Those of the party who proceeded forward in the waggone to the "Derby Inn" were joined there by their friends, when ample justice was done to the excellent tea provided, especially so by those who had walked up by the stream. No more chance had they of going out after tea, for the rain came on during tea, and continued till arrival back to the station. The Society intend going to Milner Field, the seat of Titus Salt, Esq., Saltair, on July 4th.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

A MEETING of this Society was held on April 3rd, President H. J. NEWTON in the chair.

Mr. SIDNEY BROWN exhibited a number of beautiful coloured photographs, painted on glass. Many years ago he had painted what were called ivorytypes, which he had now improved on as here shown. The colouring is fully under control, and changes

can be quite readily made from time to time, should such be desired, during the process of finishing. They are oil pictures, painted on the surface, and the cement in which they are embedded is permanent.

The SECRETARY said that there could be no question about the beauty of these pictures; they were far preferable in appearance to the old ivorytypes. To make the latter, artistic skill is necessary, and as the old ivorytype pictures are now being revived, the improvement of Mr. Brown will be quite opportune. He had never seen any ivorytype pictures that would last ten years.

Mr. J. WOOD wished to be informed of the best method for keeping a wet plate from drying during long exposures. He could not keep them moist for more than twenty minutes.

Mr. BROWN suggested that by placing the plate perfectly level on a table with the face down it could be kept moist for a long time; he had kept the plates so for hours. Glycerine is also successfully used for this purpose, after coating the plate, flow with glycerine, then expose and wash the plate. The gelatine is to be diluted with fifty per cent. of water. Treated in this way he could keep a plate moist for a week or more, and the plate lose none of its sensitiveness.

The PRESIDENT remarked that the putting on of glycerine or a solution of glycerine and water removed a portion of the free nitrate, which was essential for the development of the pictures. If, however, a solution of glycerine and water, equal parts, in which from fifteen to twenty grains of free nitrate to the ounce had been dissolved, that objection would be overcome. The President also stated that the collodion film would remain moist a long time if the back of the glass were kept wet. This could be done by laying a piece of wet blotting-paper on the back.

Mr. G. W. PAON said that a very good way to keep plates moist is to place a cap of ice in the camera-box; it prevents the evaporation of the solution from the plate. He found the ice much better than a damp towel.

The SECRETARY thought that the President's method of using dry plates much to be preferred when the work is to be done some distance off. He had kept plates moist for four hours, but then he had the inside of the camera damp, and the plate-holder padded with eight or ten thicknesses of bibulous paper.

Dr. M. N. MILLER enquired what was regarded as the best organifier. He saw it recommended in a photographic journal that, after the plate had been coated with the emulsion, it should be immersed in water, until the greasy lines were washed out of it, and then it is to be transferred to the organifier, which consists of beer and honey. His method was to put the plate in a bath of flat dish, and wash off the greasy lines.

The PRESIDENT remarked that, with some emulsions, a plate will not be benefited by washing with water prior to being treated with the organifier. If there is free silver present he would wash it, although Mr. Carey Lea succeeded by putting it immediately in the organifier. He found nothing superior to the organifier he published a year or two ago, and that is syrup of squilla, nuxvomica, and laudanum.

Dr. D. D. PARMELEE said that at the present time there was considerable excitement in the public mind in regard to blue light. He was frequently spoken to on the subject. He believed it to be nothing more than a pleasant shade, and had no peculiar curative property. He would enquire if there was any advantage in having blue light or blue screens over an equal amount of white light.

The PRESIDENT stated that the question of the actinic force of blue light was an unsettled one. Photographers who have experimented with blue glass have so far failed to agree, some asserting that they obtain increased actinic action by its use, while others maintain the opposite opinion. Looking at the question from his standpoint, without having experimented, he should say that the actinism of the solar ray could not be increased by filtering out a portion of it—that the whole was more potent than a part; and unless it could be shown that there was actually a retarding property of action in some rays of the spectrum, it would be difficult to convince him that there was increased potency in blue when separated from the other components of the white ray. According to Mr. Gaffield's statement, coloured light, whether violet, blue, or indigo, was less potent in actinic force than white light.

The SECRETARY used blue glass to a large extent, and found that different shades of it had different qualities. A general fault with it is that the tint is too deep a blue, and often upon a green or orange tinted glass. He considered a pure white glass flashed with blue, pure blue, very desirable. The light is grateful to the eyes. He believed the actinic force of the pure blue ray fully equal to the white, and for photographic purposes it has the

advantage of making the sitter feel at ease. A subdued blue light produced by frosted glass was far less actinic; he had never seen a frosted glass that was as brilliant. If the colour could be put on very thinly, by a solution which would leave the shade perfect, it would be a great advance. A good blue light could be easily controlled. He had worked considerably with the microscope in artificial light, and found that by using tinted glass very minute tissues could be made out even better than in sunlight. He saw objects that it was impossible to discern without it.

Dr. PARMELEE remarked that ladies often told him that their faces became freckled after wearing blue veils.

Talk in the Studio.

A MOIST COLOUR-BOX.—We have received from Messrs. Lechertier, Barbe, and Co., a marvellous example of cheapness. It is a moist colour-box, containing ten colours, all of which are guaranteed to be pure pigments. They are in a japanned tin box, the lid of which serves as a palette, for which purpose, also, a space in the box is provided. Three good camel's-hair pencils accompany the box; the whole being sold for one shilling. So far as we can judge by a hasty trial, the colours are very good.

SUICIDE OF A PHOTOGRAPHER.—A travelling photographer named Chapman, living in Milton Square, Margate, committed suicide by taking prussic acid on Friday morning. Jealousy is said to have been the cause.

To Correspondents.

S. M.—There is no efficient mode of removing water from alcohol but distillation. If you distil from lime or carbonate of potash, the spirit will come over, and the water remain behind.

R. S.—Hot weather often brings on a tendency to fog; and the mode of avoiding this difficulty is to use all the precautions laid down against fog. Keep the dark room well ventilated and cool; surround your bath with ice, do not use the iron developer too strong, and use a full proportion of acid.

Z. X. Y.—You will find the advertisement on the fifth page of advertisements in our issue for April 27th. See also this week.

CALLOW.—Albumenizing paper is, we believe, a fairly remunerative business when conducted with skill and enterprise. 2. The chief things required are knowledge and experience. The principal material appliances are large dishes, fresh eggs, good plain paper, a room which can easily be maintained at a suitable temperature for rapid drying, as free from dust as possible, and long rods upon which to suspend the sheets. 3. There is no work published on the subject. Articles have been written from time to time, but various points of formula and mechanical details have been preserved as trade secrets.

J. C. HAYDN.—The preservation of pure whites in developed paper prints is often a point involving trouble. One of the chief causes of difficulty arises from the fact that photographers are so frequently oblivious of the fact that excited paper is very sensitive, and do not take the pains to preserve it from all contact with light which they do a collodion film. In preparing and exciting the paper, insufficient care is often taken to exclude light, and the paper is often subjected more or less to the artificial light used. The use of acid in the silver bath is often useful. We have found the use of a trace of common salt in the developer useful in preserving the whites, but have never worked the matter out to a precise formula, we simply added a pinch of salt to the developer. If it retarded the development too much, we used less; and if it did not restrain enough, we added more.

M. & M.—You will find full details of printing on woven fabrics in our YARN-BOOK for 1868. We can only briefly indicate the details here. The whites of two eggs are beaten up with eight ounces of water, to which half a drachm of chloride of ammonium is added. The surface of the fabric is treated with this. When dry, it is floated on a sixty-grain silver bath. The printing must be very deep. The toning and fixing are conducted in the usual manner adopted with paper.

B. C.—The use of iodide and bromide of cadmium in collodion tends to produce the glutinous quality of which you complain. It is well to use these salts in conjunction with an alkaline iodide, such as that of potassium. The salts of sodium answer well.

M. M.—Chloride of gold is quite susceptible of adulteration, but whether the practice is common or not we cannot say; we think not. It is not difficult for a photographer to prepare his own according to instructions we have often published.

ANXIOUS.—The exhibition of the Photographic Society will open on the 9th of October next. Details of contributions and of the medals will be published shortly.

JANUS.—Arrived too late. In our next. Several Correspondents in our next.

The Photographic News, June 22, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE STATUE OF NICEPHORE NIEPCE AT CHALONS-SUR-SAONE—THE CYANOTYPE COPYING PROCESS.

The Statue of Nicéphore Niepce at Chalons-sur-Saone.—It is gratifying to learn that our neighbours in France are about to take steps to commemorate in that country the commencement of photographic research. Whatever may be said upon the much disputed question of early photography, there can be no doubt that in France the name of Nicéphore Niepce should be honoured as having been the first to catch up a sun picture in the camera and fix it upon paper, even if the image was not a very substantial one. We shall never, perhaps, arrive at a very satisfactory solution of the question as to who discovered photography, for the simple reason that it was not the fruit of any one man's labours; and no doubt several nations are ready to put in a claim to the honour, if information on the point were invited or desired. There is, indeed, not a single grand discovery or invention which is not claimed for half a dozen different men. The electric telegraph and the steam engine, like America of old, have many claimants, while gunpowder is said to have been found out at least a score of times. An English schoolboy who propounded that Roger Bacon was the inventor of "villainous saltpetre" would be well laughed at in a German college, where the name of Schwarz is always connected with the discovery, while both would probably get their ears pulled by a Chinese demagogue if they went to the Flowery Land with such stories. So far as we are concerned, we think the history of photographic discovery and research is best represented, as well as this can be popularly done, by the device upon the frontispiece of the *Moniteur de la Photographie*, which our colleague M. Ernest Lacan so ably edits. Here are depicted three cameos placed together, upon which are seen heads of Niepce, Daguerre, Talbot. This trio goes very far to represent all that is practical in the early history of photography, and we doubt whether a more brief and precise statement of the matter could be made. Niepce, undoubtedly, produced pictures from nature in the camera, and was in all probability the first to do so. To Daguerre, again, must be awarded the credit of having been the first to make known a beautiful and eminently practical method of securing sun images upon an opaque basis; and, in the third place, to Fox Talbot we owe the process of negative-taking, or, in other words, of obtaining pictures upon a transparent ground which, by reason of their transparency, can be employed as cliché to produce further copies. The process of photography as it is practised at the present day is essentially the process of Fox Talbot, therefore, and this philosopher, living at the present day, must indeed be gratified to see the results of his handiwork spreading so far and wide. The French nation, as we have said, has taken a step which will secure them from reproach in times hereafter. It has been determined to erect a statue of the first French photographer, and the site chosen is an appropriate one, that of his birth-place at Chalons-sur-Saone. The citizens of Chalons have taken the initiative, and have determined to collect subscriptions, not only from their own country, but from abroad, and by way of commencement have headed the list with the sum of five thousand francs. According to our French Correspondent the movement is not commenced a moment too soon, for he tells us that in the churchyard where Niepce and his wife were buried there is not even a wooden cross to mark their resting place, while brambles and weeds run riot over their graves. No doubt there will be many in Great Britain ready to contribute their mite to the erection of a statue to Nicéphore Niepce, the old retired lieutenant, who had enough confidence in English enterprise and fair play to undertake a journey to this country fifty years

ago—a journey, be it remembered, to a man of his humble means, which required some courage, in those days, to begin. He must have been pretty confident of the value of his process and of its capacity, to have journeyed so far. None can blame him for keeping his invention so close. He had worked at the matter all his life, and consequently hesitated to divulge the secret which constituted his sole fortune. "The sun did it," was the only explanation he vouchsafed to Faraday, when he showed the great English philosopher the first photograph of Kew Church, in the year 1827; and "the sun did it" were the quaint words that flashed up in Faraday's memory twelve years afterwards, when a friend gave a Daguerreotype into his hand, and began to explain how it was done. Nicéphore Niepce was dead then, but the Frenchman's terse explanation and his singular picture were so vivid in Faraday's mind that they served to help the Niepce family in securing their well-earned pension from the French Government. Faraday told Bauer, the Secretary of the Royal Society, the circumstances of the case, and these being properly represented to the French *Académie*, were instrumental in obtaining for Niepce's son Isidore the pension which the father himself would otherwise have enjoyed. And now we are told the Chalons citizens are bestirring themselves to do something to retrieve the honour of their fathers, and their own. Daguerre made a name, and acquired property; we in this country are never likely to forget Fox-Talbot, nor the eminent services he has rendered his country; Nicéphore Niepce, on the other hand, the humble philosopher and citizen of a small provincial town, was slipping fast from our memories when M. Victor Fouque came to the rescue and told the homely story of Niepce's life in that interesting work, *La vérité sur l'invention de la photographie*. To him photographers owe a great deal, and if the project of the Chalons citizens is crowned with success—as there is, indeed, every prospect—it will be more to the instrumentality of M. Fouque's pen, than anything else, that the statue of Nicéphore Niepce will be reared at his birth-place.

The Cyanotype Copying Process.—It is not unusual, as every photographer knows, for a process to remain *perdu* for some years, and then to get made known again with some mystery and circumstance. We see old friends revived in this way from time to time, and like somebody whom we may meet for the first time in a quaintly shaped hat or a different coloured coat than usual, we fail to recognize him at the first moment of our rencontre. But it is only for an instant that the deception holds good, and the well-known features are as apparent as ever as soon as we get on close terms again. The Cyanotype process, as Sir John Herschel used to call it, is the latest attempt at "fraudulent enlistment," and the circumstance that we have here to do with a genuine article, and not a spurious one, does not make the deception the less barefaced. The Cyanotype process as practised by Sir John Herschel is a very simple affair, and one that is found extremely useful for copying outline sketches, or multiplying tracings instead of using tracing-paper. Sir J. Herschel employed it, as does Professor Herschel, of Newcastle, to the present day, for making copies of their calculations or astronomical tables, the characters or figures being produced in white upon a blue ground. The paper, ready prepared for use by draughtsmen, or others, is to be purchased in Paris, and also, we believe, in this country, of Messrs. Marion, of Soho Square; but those who desire to make it for themselves can easily do so. Good smooth paper is treated with—

Citrate of iron (or ammonio-citrate)... 140 grains
Red prussiate of potash ... 120 "

Dissolved together in two fluid ounces of water. The solution can be kept in a glass stoppered bottle well wrapped up in a dark cloth, or shut up in a dark cupboard, for any length of time. It is applied by means of a brush or tuft of cotton wool, and the surface dried in the

dark. The paper is exposed to light under a tracing, being kept flat by glass plates, and the print fixed by washing in clean water for a few minutes. The ink lines of the tracing must be of an opaque black, such as Indian ink, &c., to prevent the rays of light from passing, and as a matter of course the copy will not be sharp unless the paper is kept firmly in contact with the tracing.

THE ACTION OF LIGHT, TEMPERATURE, AND ATMOSPHERE UPON PIGMENTED SENSITIVE TISSUES.

BY J. R. SAWYER.*

THE subject that I have the pleasure of bringing before you is not by any means a new one, and has, I believe, been introduced to your notice previously, more especially by our friend Captain Abney, who read a paper on this subject in the early part of 1872.

In the *British Journal Almanack*, 1872, I also find a paper by J. R. Johnson, from which I give an extract.

It was reserved to Lieutenant Abney to recognize the full value of this fact (viz., the continuing action of light on a partially exposed print), and to derive from it most important consequences in actual practice—so important, indeed, that they may lead to a complete revolution in the art of solar printing in carbon.

"Lieutenant Abney, having found that the action set up in the different gradations of a photographic negative was continued in darkness in the same ratio, each gradation or graduated tone of the picture continuing to increase in intensity *pari passu* with the others, determined, during the dark days of December, to give his prints one-fourth of the actual exposure which experience had found necessary for complete action, and to leave them to mature that action in darkness. Experiment showed him that fourteen hours' darkness were necessary to complete the action set up, and after that time had been allowed to elapse, the prints in development were found fully exposed."

I also believe the subject has been treated of more recently by our Honorary Secretary, Mr. Baden Pritchard; but at a time when the production of photographs in permanent pigments has become one of the recognized commercial elements in the business of the professional photographer, and taking into consideration the interesting character of the results, I venture to bring the subject before you this evening, with a view to afford some data for further systematic experiment.

Pigmented tissues are of two kinds as regards the methods employed of making them sensitive to the action of light. First, those made sensitive by the introduction of the sensitizing compound into the mixture of gelatine and pigment used in coating the paper; secondly, those made sensitive at any time after their manufacture, by being immersed in the sensitizing fluid; but as the action of which I propose to treat seems to be the same in both cases, I shall make no distinction between them, but simply speak of them as sensitized tissue. In making the material, consisting of gelatine and pigment spread upon paper which we call tissue, sensitive to the light's action, differing results are obtained by increasing or diminishing the quantity of the chemical salt employed as sensitizer; but whatever be the quantity employed, the beginning of a change is at once set up in the tissue itself, and the gelatine forming the medium for the colour has within it the germ of complete and absolute insolubility, even if preserved from the action of light and air in the most careful manner; but in the absence of light and air, the oxidation necessary to secure insolubility goes forward but very slowly; and the tissue may be kept many weeks in a sensitive and even usable condition.

But what I wished to call your attention more especially to this evening is, the change that gradually takes place

after the exposure of sensitive tissue for a very brief space to the action of the light. We will take for example (say) a negative which, with a given tissue, requires an exposure of six tints; if we take several pieces of this tissue, and expose them one after the other for a very brief period upon our negative,—say for one tint—we shall have a series of pictures which would be considered very much under-exposed; and if we develop one of these soon after its exposure to the light, we find, of course, that it is very much under-exposed, and, as a picture, worthless; we find that it is only in the very deepest shadows we get any vigour, that the half-tones will not hold, they wash away, and the whole is simply worthless.

Now let us cut our other pieces into two portions, distinguishing them by a letter on one portion, as well as the numbers. No. 1 we have developed, and we know exactly what effect is produced by the brief exposure to light; having cut the other portions in halves, let us distinguish them as Nos. 2, 2A, 3, 3A, and so on. Put those pieces distinguished by a number into a tin case, carefully sealed from the light, and as far as possible from the atmosphere; put those pieces distinguished by a number and a letter into (say) an ordinary drawer. We thus create separate conditions, one series being kept from the light and to a considerable extent from the atmosphere, the other being kept from light, but in contact with the air, and consequently to a great extent influenced by changes of temperature or hygrometric conditions.

To continue our experiment, let us day after day develop one of the exposed prints, of course developing together the halves that belong to each other, and the results will be eminently instructive. We shall find that, day by day, the action of the light will be continued—not a universal fogging and decomposition over the whole of the surface, but every gradation of light and shade preserving its proper balance, until at last a point is reached when the picture is as good as possible—that is to say, a photograph in pigmented tissue has been produced by allowing the light to act upon it for only one-sixth of the time supposed to be necessary, the remainder being due to the continuation of the light's action when the picture is no longer under its direct influence. But it must not be forgotten that our pieces of exposed tissues have been kept under slightly different conditions—both protected from the action of the light, but only one specially protected from the action of the external air. The one protected from the action of both light and air reaches its proper gradation of light and shade much more slowly than the one protected from the light only, showing that other elements than that of the action of the light enter into the making of the picture. The examples that I commend to your notice this evening have been produced in the manner I have described; the two halves of each picture have been joined together, and show in a marked manner the additional action conferred by the atmosphere not being perfectly excluded.

I have said that the moment the tissue is sensitized it contains the germs of its insolubility, and it must not be forgotten that insolubility means the power of producing photographs. It is a very frequent complaint that tissue washes up in development, that the half-tones become chalky and bare; but if the same tissue is kept for a short time it is no longer liable to these defects; it gradually acquires the necessary cohesion of its particles, and the resulting pictures are as perfect as possible.

Far from presenting difficulties, my decided opinion is, that in pigmented tissues we have means of modifications and adaptations perfectly unknown to photography before; not only have we colour—that is to say, the power of using almost any pigment that may be desired—but we have the power of combining pigments, of getting effects of force that are impossible in any other way. Take the case, for instance, of Turner's Liber; it is well known that the deepest portions of these are absolutely dug out of the plate with all the vigour of a master's hand; in the impressions—partly,

* Read before the Photographic Society of Great Britain.

no doubt from the skill of the printer, but mainly from the bold vigour of these lines and touches—they appear almost black upon the sepia ground of the picture. An ordinary photograph would be totally inadequate to represent these; it would make the picture all one tint; but a judicious method of combining colour in the tissue, giving a coat of a suitable dark colour, then upon that imposing a layer of picture colour, enables us to render these dark touches with a fidelity rivalling the best originals. The same principle holds good in many other cases. Given, for instance, a landscape: is it impossible, I will not say to produce natural colours, but to produce a harmonious and artistically tinted photograph simply by the super-position of colours over each other? To understand how this may be achieved is not difficult. A pigment picture is a picture in relief, the deepest shadows being represented by the greatest thickness of gelatine, the picture being produced under the negative by the light being enabled to penetrate the film according to the degree of gradation in the negative; suppose then we had a tissue formed of (say) four tints, the lower one a blackish-brown, the next a red, the next a yellow, the upper one a blue, in the deepest shadows the negative offering but little or no resistance to the light, would enable it to penetrate to the lowest coating; the next grade would go more or less to the red; the next to the yellow; whilst the sky, if a landscape, would be represented in blue; the white paper would represent those portions of the negative known as high lights, and would represent white clouds.

It is not my intention to enlarge upon this branch of the matter upon the present occasion, and I must equally decline to treat the question of obtaining a far greater and more exalted sensibility in tissue than we have at present; suffice it to say that even now it is possible to work tissue having a rapidity five or six times as great as that of ordinary silver paper, and this sensibility attained solely by the action of light and atmosphere upon tissue sensitized in the ordinary way. The points that I wished especially to call your attention to this evening are the continuing effects of the decomposition or insolubility conferred upon the gelatine by the addition of a chromate salt, and to bring before you examples of the practical utilization of that action in very much reducing the time of exposition of the prints.

In addition, I desire to emphasize most strongly the fact that newly sensitized tissue is not in the best condition for use; that it frequently produces hard and chalky pictures; that it requires long exposure, and that by keeping for a few days, the time allowed for the action of the light may be much reduced, whilst the resultant pictures leave nothing to be desired; this latter part of the subject was very well put by the editor of the *British Journal* in his issue of April 27.

As the summer is, we hope, now coming very near to us, I may be pardoned making a few remarks upon the special precautions to be taken in hot weather. Last summer a wave of failure swept over carbon printers which engulfed all but a very few; this wave of failure was synchronous with a wave of warm temperature. We may expect, at least hope for, warm weather again, and the necessity for coolness, both in the operator and the operated upon, will be manifest.

Keep the tissue in a cool, and not too dry a place. Let the sensitizing bath be kept cool either with ice in it or ice round the dish; once out of the sensitizing bath, it is all right at ordinary temperatures.

After the exposition of the tissue under the negative comes the first transfer to the glass or other temporary support; it is indispensable that this water should not exceed fifty-six degrees of Fahrenheit at most; employ ice here, do not allow the tissue to be handled with hot hands, and let it be fingered as little as possible. Write up in big letters in your operating and developing room

"KEEP COOL."

and you will have no more difficulty in working carbon or pigment printing in summer than in winter, and it is quite certain that a supply of tissue of two or three days old will

yield the best pictures, with a comparatively short exposure.

I hope soon after our recess to bring before you the results of many experiments in directions that I have only just been able to indicate. I believe pigment printing to be quite in its childhood, but that it will grow to the full stature and strength of manhood by the fostering care and careful experiments of many workers.

NOTES ON THE THEORY AND PRACTICE OF EMULSION PROCESSES.

BY HERBERT B. BERKELEY.*

I HAVE been requested by your Council to introduce the subject of *emulsions* for your consideration this evening. Your Society comprises so many well-known experimentalists in this branch of photography, that I hope my notes may provoke some discussion among them; more than this I cannot well hope to do.

I wish, more especially, to direct your attention to the theory of emulsions generally. I will mention some of the rules which have been dictated by the experience of others, and the theories by which they are accompanied, introducing a few experiences and suggestions of my own; and will conclude with a few notes on what, I consider, constitutes a good emulsion, and the best method of working it.

As, doubtless, with most inexact sciences, the followers of photography include men holding opinions often entirely opposed to those of others; this is sometimes so remarkably the case, that one is led to wonder how such discrepancies can occur; and we can only conclude that, where such complicated agents are employed, and where conditions of working so easily effect the result, widely different opinions are likely to be the rule, rather than the exception.

It is by no means improbable that we have not yet formed silver bromide in contact with the most suitable organic substance for the obtaining of the most exalted sensitiveness. How few substances have been employed for the formation of emulsions—a method of working which admits of greater divergence in this respect than the bath processes! It is true, however, that a fairly long list of additions to the collodion emulsion have been recommended from time to time—many of them organic—generally with the object of increasing the vigour of the developed image; but there can be no doubt that certain organic substances are highly conductive to sensitiveness when present during the formation of the silver bromide. Those whose experience with emulsions extends to the formation of them will readily admit this to be the case; they will probably even go further: they will recognise the fact that it is not merely sufficient to form the silver bromide in the presence of a suitable organic substance, but that, also, the organic compound which this substance forms with the silver nitrate must be present in the finished emulsion—I refer especially to washed emulsion, otherwise there will be a loss of sensitiveness, accompanied by other troubles of a mechanical nature. It behoves us, therefore, to keep in mind this fact when making washed emulsion, and not to rest satisfied that all will go well if the silver bromide be merely formed under favourable circumstances.

The influence of the fineness of division of the particles of silver bromide has not, apparently, received much attention, although a fine film is generally preferred. I do not mean in contra-distinction to a coarse film, but to a film in which the particles of bromide are microscopically coarser than those in the finer film. There is no doubt that a film in which the bromide is so fine that it appears like a stain, giving a very transparent plate, will yield a negative of the highest density; coarseness of film conducing to the opposite result. It is my opinion that the fine films bear more forcing without fogging, but that they

* Read before the Photographic Society of Great Britain.

are not more sensitive than the coarser films. I rather incline to the belief that an extremely fine state of division is inimical to sensitiveness; that this is contrary to general opinion I am aware, but my experience leads me to this conclusion.

The influence of excess of silver nitrate on emulsions is generally admitted, but the theory of its action appears yet to be a matter for speculation. In the case of collodion emulsion it is commonly supposed to act upon the silver bromide and on an organic constituent of the collodion, the result being either a chemical combination of these latter, or a mechanical mixture. Practically we find an increase of sensitiveness and density to be the result of this method, though by long keeping the emulsion arrives at a stage where thinness of image and fog is the characteristic. The thinness is due, I believe, to the mechanical state of the collodion film, whereby development takes place on the silver bromide, unrestrained by the enveloping collodion film.

Excess of silver on gelatine emulsion does not seem to act in the same way as on collodion. We appear rather to obtain an increase of density, than an increase of sensitiveness, though there is generally some gain in this direction too. It is, however, a curious fact that a large excess of silver nitrate is prejudicial to sensitiveness, an experience which is borne out by the fact that keeping a gelatine emulsion with excess of silver brings about a loss of sensitiveness, and clearness rather than fog.

The subject appears to require further investigation to prove that silver bromide is acted on by silver nitrate, *per se*; though, doubtless, an organic compound of silver is formed which conduces materially to both sensitiveness and density; and in the case of collodion the film is modified mechanically so as to be more easily acted on by the developer.

In the case of gelatine the film is not affected mechanically; hence we fail to obtain much gain in sensitiveness. It is also possible that the organic reaction is not so favourable as with collodion.

If silver nitrate act on silver bromide when unrestrained by nitric acid, and more slowly when restrained, it is only natural to ask what the compound is which causes such a general darkening of the film on applying the developer. I am not aware of any theory connected with this "fogging action," and I suggest the formation of sub-bromide of silver. The presence of nitric acid restrains this action for a considerable time, varying with the circumstances of each particular case. But I am much inclined to dispute this theory, and to suppose that a change in the character of the collodion, either chemical, or physical, or both, is the cause of this abnormal action. We do not experience this action when forming an emulsion with either gum or gelatine, and though both may be "restrainers" in a sense, it is difficult to suppose that either would entirely prevent the formation of the sub-bromide.

Since writing the above, Captain Abney has told me how he believes the sub-bromide of silver is formed in the emulsion. He says that it is formed independently of the silver bromide, which results from the addition of the silver nitrate to a soluble bromide; but I leave it to Captain Abney to make his own remarks on his investigations, which I have no doubt he will do, if present here this evening.

(To be continued.)

ON THE ALBUMEN EMULSION.

BY CAPTAIN ABNEY, R.E., F.R.S.*

SINCE I understand that Mr. Berkeley has been referring in his paper to an emulsion process with which I am somewhat connected, I have ventured to offer a few remarks to the Society respecting it. Several friends who have tried

* Read before the Photographic Society of Great Britain.

it state that there is a tendency for the film to leave the plate, curling up when drying. Except when working with a thick emulsion in which ether was decidedly in excess, or when the pyroxyline was of a very contractile nature, I never found this difficulty arise. This, of course, may be overcome by using a more powdery cotton and less ether. I will briefly summarize the method of preparation. Sixteen grains of ordinary pyroxyline, such as employed in ordinary collodion for the wet process, are dissolved in six drachms of ether and six of alcohol. In this quantity of collodion are dissolved twenty grains of zinc bromide; one grain of dried albumen is added to this after being dissolved in one drachm of water, in which there may be a drop or two of ammonia (if necessary), to secure solution. The albumen solution must be added carefully, drop by drop, till an emulsion of albumen is formed. The collodion may now be neutralized by a little nitric acid, and enough silver nitrate dissolved in the ordinary manner to give an excess of at least four grains in the above quantity of collodion over and above that necessary to convert the zinc bromide and bromine and albumen into silver bromide and albuminate. A saturated solution of bromine in water is prepared in the dark, and ten drops added to the collodion after three-fourths of the silver solution has been stirred in. The remainder of the silver is then added. By adding this bromine water, nitric acid is liberated, silver bromate formed, and also sub-bromide of silver converted into bromide. This method of adding the bromine prevents the formation of any appreciable quantity of bromal, a product which is very detrimental to sensitiveness. The emulsion should stand eighteen hours, and be then washed and dried in the usual manner, leaving a very slight excess of silver in the pellicle. The pellicle is dissolved in equal parts of ether and alcohol, care being taken to add no more than is requisite, as in a thin emulsion it is difficult to secure intensity. The peculiarity of this emulsion is that a film of it transmits the green and violet rays, absorbing the red, to a certain extent. I exhibit a film which shows the peculiarity. This emulsion is very sensitive, chiefly, I suspect, on account of the fine state into which the particles of the sensitive salt are divided; the transmission of the blue, and absorption of the red, show the minuteness of the grain. The emulsion is sensitive to the red rays of the spectrum, and also to the less refrangible dark rays. At the time I was afraid that the heat of summer might alter the plates, owing to the dark radiation, but these are apparently so low in the scale that they are ineffectual to cause decomposition. It may seem a stretch of imagination, but the day may not be distant when, in a darkened room, it may be possible to photograph a black hot poker, or a kettle containing boiling water.

REMARKS ON THE SILVER NITRATE BATH.

BY R. W. THOMAS.*

I REGRET that I was prevented by circumstances from being present at the last meeting of the Society.

The discussion that has taken place for several consecutive evenings on the Silver Nitrate Bath has been, and must obviously be, most incomplete as long as this subject is isolated from, and is made to form no part with, the composition of the collodion, which, sooner or later, effects the changes that are a source of trouble to photographers.

For very obvious reasons the subject is not likely to be properly ventilated. As one of the largest manufacturers of collodion in this country, I must protest against the assumption that a sulphate is likely to be introduced by either want of care in washing the pyroxyline, or by its introduction through impurity in the iodizing salts employed.

I have always maintained, and a very large experience confirms my view, that in order to obtain the most satis-

factory results, absolute purity, both in the preparation of the silver nitrate and the water used, is a most essential condition.

As a chemist and practical photographer, I set my face entirely against the pump water and sunning processes, and will further add that re-crystallizing silver nitrate does not altogether free it from deleterious impurities, and that distilled water fit for making a bath is not so easily obtained as some may think.

The preparation of silver nitrate bath has been for some years a success with me, commercially speaking; many of our largest photographers avail themselves of the convenience I am able to offer by keeping ready prepared, and sending out in a perfect state, an article of so much importance.

I have always been careful not to speak at these meetings on subjects bearing on trade manufactures, but on this occasion I have been called out, so to speak, and silence on the subject might be improperly construed.

I have always maintained that neutrality in a silver bath (I do not mean of course alkalinity), quite a possible condition when the water is saturated with oxide of silver, is the proper condition for this solution, and should this state be found unsatisfactory in working, the fault lies either in the light used in the operating room, or in the want of a slight trace of iodine in the collodion. My paper on this subject is tolerably well known, and will be found in my treatise on photography.

EPITOME OF THE MANIPULATIONS AND DEFECTS INHERENT TO HUSNIK'S LICHTDRUCK.*

The Manipulations Summarised.—1. The patent glass plates are rubbed with ammonia, and then cleaned with spirit and levigated chalk.

2. Plates previously employed are put into a caustic lye (soda or potash) solution.

3. Matt plates are invariably grained with the finest emery.

4. The plates are finally washed, rinsed in clean water, and dried.

First Preparation.—1. White of egg is beaten to a froth. 2. The white of egg, when settled, is mixed with soluble silicate and water. 3. The solution is filtered. 4. The plates are dusted. 5. The plates are breathed upon, and the albumen and silicate solution applied. 6. The plates are set up to dry. 7. The superfluous liquid which has been poured off is filtered. 8. The operations 5, 6, and 7 are repeated until all the plates are coated. 9. The plates are warmed at 30° to 35° Reaumur, or allowed to remain a day. 10. The plates are washed for some time in cold water. 11. They are set up to dry.

Second Preparation.—1. Preparation of the gelatine solution. 2. The drying box is warmed to 45° Reaumur. 3. The plates are put in to warm. 4. The plates are dusted. 5. The gelatine solution is spread upon the plates. 6. The superfluous solution is poured off. 7. The drying box is opened and the plates put in, together with the remaining solution, in a stoppered bottle. 8. The box is closed. 9. The box is maintained at a temperature of 45° R., for drying the plates. 10. The solution drained from the plates is filtered. 11. The solution is spread upon the dry warm plates a second time. 12. The superfluous solution is allowed to fall off in the opposite direction to what was formerly the case. 13. The plates are put into the box to dry, being placed in a reverse position to formerly. 14. The plates are dried a second time, at a temperature of 45° R. 15. The plates are taken out of the drying box and put away. 16. The films are printed. 17. They are put into cold water to wash. 18. They are dried. 19. The plates are moistened. 20. The printing

surface is wiped. 21. The plate is inked up with litho varnish. 22. The paper is applied, and a proof pulled.

Defects and their Cause.—1. If the glass plates get scratched in polishing, it is due to the emery not being moist in every part, or to too much pressure being used in commencing the operation, or the emery has not been properly levigated.

2. The solution first employed sometimes has bubbles when filtered; the cause of this is, that it is allowed to fall; the liquid should always be permitted to run down a glass rod.

3. When setting up the plates to dry, dust from the floor settles upon the film and dries. To obviate this, the floor should be covered with filter paper.

4. The gelatine will not dissolve at times in the bath. It should be soaked well in cold water first, and then dissolved before the bichromate is added.

5. The waste solution from the plates runs down the sides of the box, and collecting at the bottom burns and emits noxious gases. This is prevented by putting linen frames into the bottom of the box, with sheets of filter paper, and changing these frequently.

6. The surface of the gelatined plates is matt in places when taken out of the drying box. The cause of this is the imperfect closing of the cover, or an accidental opening, or a variable temperature during drying.

7. If the plate has at one end a different grain to the other, the temperature has not been raised quickly enough to 45° R., or it had cooled too much when opened.

8. When the grain is too coarse and the film too stout, the reason is, that too much spirits has evaporated, or the plate has dried in too upright a position. A coarse roller produces the same defect.

9. When the plates have a brownish colour, and the images develop badly on exposure, there has been too much heat in drying, or an unequal distribution of the warmth.

10. Sometimes the plate, even when manipulated with a thick ink, gives no half-tones in the shadows, and gives monotonous flat pictures; the cause of this is over-exposure, or the plate has been under the hands of the printer too long.

11. When the plate gives white impressions, which show no half-tones in lights, it is a sign of too short an exposure, too little glycerine in the damping water, or that the plate has been dried at a low temperature.

12. If, after five or ten good impressions, there follow pictures flat in the shadows, the reason is that there is not grain enough, and that the plate has been dried at too low a temperature.

13. If the prints are on one side darker than the other, then the film is of unequal thickness.

14. When the glass plate breaks in the press, it is a sign that the bed is unequal.

15. In case the paper sticks to the high lights, and tears off, it is a proof that too soft a gelatine has been employed, or that the work-room is too warm. The defect may also be due to the paper not being sufficiently moistened, or to there being insufficient glycerine in the damping water, or to the circumstance of the latter not being cold enough.

16. If spots upon the print or double impressions result, the reason is, that the paper has been laid over the whole surface of the plate, or that the bridge has not been used; or it may be that the paper was too dry.

PLATINUM PLATING.—M. Dodé has patented a plan for giving cast objects a coating of platinum. The object as cast, or after being enamelled, is first washed over with a brush dipped in turpentine; a mixture of borate of lead and oxide of copper is next applied, and the casting dried in a drying stove. The next step is to immerse the object so prepared in a composition of borate of lead, German litharge, platinum in the state of chloride, ordinary ether, essence of lavender, and aniline (f) acid. Finally, the platinized object is submitted to the action of heat.—*Scientific American.*

* From *Gesamtheit des Lichtdrucks.*

The Photographic News.

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VENTILATION OF GRIEVANCES.

We publish a letter on another page in which Captain Turton calls attention to what he conceives to be a want in photographic journalism. Similar suggestions not unfrequently reach us. Captain Turton thinks there is need for a freer and more outspoken opinion in the journals as to the demerits of various articles commercially supplied to photographers: commercial dry plates being the sinners most needing denunciation at present.

We can well understand the position taken by Captain Turton, and others who think similarly. They argue that as certain goods are brought under the attention of photographers in the journals, their manufacturers being allowed to parade the virtues of their goods in the announcements, it is surely legitimate when they turn out imperfect that the journals should be open to complaints whereby others might be warned against purchasing inferior articles. And they often argue further that as the Editor of a journal is regarded as the "guide, philosopher, and friend" of struggling photographers, and is set in a watch-tower, that his voice should be heard in denunciation of sham pretensions amongst advertisers. A little reflection will show that both these assumptions are erroneous, and that an Editor should not himself, or permit others, lightly, to denounce the commercial products of any manufacturer. In the first place, the law of libel steps in to protect any one from the publication of statements which may injure him in his business or professional avocations, and that without reference to the truth or falsehood of the libellous statements. As the proprietor of a journal is the sufferer in the case of libel, an Editor is bound to maintain a scrupulous supervision as to the publication of anything which may by possibility come under the operation of this law, the comprehensive powers of which are by no means well defined. If no such law existed it would only be just that the same care should be used. It is a somewhat serious matter that the commercial reputation of any should be perilled upon the opinion of an individual who, although honest, may not be infallibly capable. We have frequently seen cases in which subtleties of manipulation almost, or quite, impossible to trace or detect, have made all the difference between success and failure. We remember a special case in which a packet of commercial dry plates were under test. One had been exposed and developed by a skilful operator, the result being dense fog. Another plate followed with a similar fate. In the dark room was a photographer of pre-eminent skill, but quite unfamiliar with the plates in question. He tried a plate next. The varied solutions used in alkaline development had all been prepared previously by Operator No. 1. Operator No. 2 had simply mix sufficient in his developing cup. He proceeded to develop, and produced a brilliant, excellent negative; otherwise the plates would have been denounced as useless. It does not follow that all failures are due to any failure in the photographer's skill; but even then it is not legitimate to publish denunciations to the detriment of the manufacturer. *Caveat emptor*, is an old and a wholesome motto in commerce. Absolute certainty, or guarantee of the excellence, of the goods of any firm can rarely be had, except in cases where the long established reputation of a firm has established its position beyond doubt; and a reputation so acquired is valuable trade capital. With experimental manufactures there is generally some risk, which must be undergone by both manufacturer and purchaser, and it is certainly not the duty of a conscientious journalist to denounce or permit others to denounce occasional imperfections in goods, whether advertised in his pages or not.

But whilst a published journal cannot, with propriety, enter into the discussion of such point, and no photographic society permits the discussion of commercial questions, we think we can point out to Captain Turton and to others in his position, practising photography with comparatively little sympathetic intercourse with other photographic workers with whom they might discuss such grievances. We claim some credit for self-sacrifice, inasmuch as the remedy we are about to suggest may, in some respects, be slightly antagonistic to the interests of regular journalism. We suggest the establishment among groups of amateur of "ever circulating magazines." The plan of the ever circulating magazine is simple. Its staff of contributor and its readers are the same. Its staff may consist of a dozen, a score, or a hundred persons. Say that it commences with a score. The first of these, call him the conductor, writes a paper on some subject of interest, relating how, in using So-and-So's transcendent plates, ever negative was covered with comets, stars, and fog. This he forwards by post to No. 2, who contributes his experience on the same or some analogous subject, and, stitching it to the contribution of No. 1, sends it off to No. 3 who follows suit, and so on until the whole of the twenty have added something. It then returns to No. 1, who having read all which has been added since it left him removes his own first paper, adds another, and again sends the magazine on its travels, each one on receiving it pursuing the same course. Every paper thus goes through the hands of the whole and each one contributing. In such a magazine any form of grievance can be discussed because it is not published, and such a magazine furnishes a direct means of sympathetic intercourse amongst those who are working through similar difficulties. Our own pages provide, of course, a similar form of intercourse and intercommunication; but the more direct and more private means provided by the ever-circulating magazine would, however, more especially meet the wants of many. The stimulus to recording experiences afforded in such case would, doubtless, lead to the production of valuable papers of interest, to a wider public than those of the private magazine, and in such we should hope occasionally to secure papers for the interest of photographers at large.

NOVELTY IN PORTRAITURE.

An interesting novelty in portraiture appears in the recently issued number of Mr. Fitzgibbon's excellent *Practical Photographer*, under the name of the "statuesque photograph," introduced and produced by Mr. Landy, of Cincinnati, a portraitist well known in connection with pictorial effects in photography. The first impression the illustration in question conveyed to our mind was that it was a reproduction from a sculptured bust in marble. On examining more closely, we find that it is a portrait from a living model with considerable beauty of feature and form. The eyes are closed, and the rippling hair, which

is probably powdered a little, is arranged in classic fashion somewhat after that of the well-known *Clytie*. The face, which is taken in profile, is inclined to the shoulder. The camera stands behind the figure, a back view of the shoulders and neck being obtained, with the face, as we have said, in profile. Drapery in massive classic folds hangs round the lower part of the shoulders and bust. The pose and composition are full of classic repose, but the sculpture-like effect is most essentially dependent upon the skilful lighting, which, whilst giving the utmost roundness and modelling, is singularly soft and delicate, with exceeding tenderness in the shadows and reflected lights which suggests white marble. The principal light is apparently a concentrated top front light, which marks out the edge of the profile with a delicate line of light against the dark background. All the remainder of the face and figure is in a delicate mezzotint without a single black shadow or chalky high-light. The picture is printed in an oval medallion.

This style could never come into use for general purposes; but it is, nevertheless, a charming novelty, which may be found very useful in special cases where novelty of effect is desired and a suitable sitter is found. In any case, an example or two of such a style will give variety and interest to a collection of specimens.

THE MEDALS AT THE NEXT EXHIBITION.

THE following are the medals offered for competition at the next Exhibition of the Photographic Society. There are, it will be seen, twenty-six medals offered; twenty-three of which are for forms of excellence specially indicated, three being left at the disposition of the judges for any form of excellence which may seem to them to merit recognition, but which had not been specially contemplated by the Council. As there is, possibly, a little ambiguity in the statement as issued, we may briefly point out the intention. In many cases it will be seen "two medals" are offered "for the best landscape ten by eight and under, and above ten by eight;" "two medals for the best portraits twelve by ten and under, and above twelve by ten," and so on in other cases. The meaning is that one medal is offered for the best landscape any size up to ten by eight, and one medal for the best portraits any size up to twelve by ten, and also one medal for the best landscape any size over ten by eight, and one medal for the best portrait over twelve by ten. The aims for which the medals are offered, it will be seen, pretty well cover the ground of competition in photography:—

Two medals for those pictures which, in the opinion of the Jury, shall display the greatest general excellence.

Two medals for the best landscape, ten by eight and under, and above ten by eight.

Two medals for the best portraits, twelve by ten and under, and above twelve by ten.

Two medals for the best single figure study, twelve by ten and under, and above twelve by ten.

Two medals for the best enlargement untouched, and for the best enlargement and *negative* by exhibitor.

Two medals for the best *genre* pictures.

Two medals for the best photo-mechanical prints.

One medal for the best study from animal life.

Two medals for the best instantaneous pictures.

Two medals for the best six stereo transparencies.

One medal for the best frame of dry-plate photographs.

One medal for the best micro-photograph.

One medal for the best specimen of surface printing from metal.

One medal for the best apparatus.

Three medals will be placed at the disposal of the jury for any novelty or other form of excellence in process or result.

The awards will be decided by a jury consisting of seven members: the President of the Society; two members of Council; two members of the Society, not being members of Council; two artists of high reputation.

The names of the jurors will be announced to the Society when the gentlemen who may have been asked to serve have accepted the duty. To be distinctly understood that no award will be made where the works in competition are not of sufficient merit.

CARBON AGAINST SILVER.—A CHALLENGE.

SINCE the visit of Mons. Lambert to the United States, the controversy as to the respective merits of carbon and silver printing has waxed hot amongst American photographers. Our Philadelphia contemporary has placed itself in antagonism to carbon; *Anthony's Bulletin* and Mr. Fitzgibbon's *Practical Photographer*, without strong partizanship, giving carbon welcome and fair field. In the June number of the vigorous and healthy St. Louis journal, into which Mr. Fitzgibbon puts so much of his own vitality, a challenge appears, offered by Mr. James Inglis, of Montreal, a well-known skilful and successful portraitist, for a competition of carbon against silver, the stakes to be about one hundred pounds sterling. Here is the challenge as it appears in the *Practical Photographer*:—

"To give a practical turn to the wordy discussion that has been raging over the carbon processes of M. Lambert, I will offer a challenge to the advocates of silver printing who are non-licencees. The stakes to be \$500, to be deposited in a bank, to be decided upon by the officers of the N. P. A. The conditions of the contest to be as follow:—

"For the best photographic prints, for one or all of the Journals published in the United States (on condition that a remunerative price be allowed for the pictures).

"In the event of the journals not accepting the pictures for illustrations, the challenge shall then be for the best fifty chromotypes against the same number of silver ones.

"Should any of the journals accept the pictures, they shall appear simultaneously in the same journal for July or August. These being the two hottest months in the year are chosen to establish the fact of the practicability of the Lambertype and Chromotype processes in warm weather.

"The subject for competition shall be a bust of a man, woman, or child. The points for competition shall be softness, depth, and roundness, together with the artistic finish of the picture as a whole.

"The judges to be ten in number, and chosen by the officers of the N. P. A.—to consist of three non-licencees, two artists, two amateur photographers, and one chemist.

"I might have added a few more points for competition; for instance, that inside the mask of the picture should be full glazed, and outside matt finish; also a combination of different shaped masks and tinted borders, and the printing-in of the name and address. But as these complications might be more than a silver printer would care to trust himself on, and as I do not desire to put any obstacle in the way of an acceptance of the challenge, I forego those and many other points of excellence, knowing them to be beyond the range of silver printing.

"That photographers may not be deterred from investing in one of the finest processes in existence, I will here state, for their benefit, that I have only been working successfully about six weeks at these processes, yet I am confident enough to challenge those who have had from twenty to thirty years' experience in the silver process—thus, at least, showing my appreciation and confidence of this much-abused process."

FRENCH CORRESPONDENCE.

THE NEW LAW RELATING TO PHOTOGRAPHY IN PUBLIC MUSEUMS AND GALLERIES—ONLY THE DRY PROCESS ADMITTED—A GOVERNMENT PHOTOGRAPHIC ESTABLISHMENT—

TOBACCO AS A PRESERVATIVE FOR DRY PLATES—WHAT IS WANTED IN THE FORM OF A PRESERVATIVE.

THE Minister of Public Instruction has just taken a step which will prove of the highest importance, not only to

photographers, but to students, writers, artists, savans, &c. By an Act which has just been published, bearing date the 1st June, in the *Journal Officiel*, the doors of all the State collections have been opened to photography—libraries, archives, galleries, museums, art collections, &c. Till now, access to these establishments was but rarely accorded to the camera, and only those armed with very special recommendations were permitted to secure photographs, so that any general work was rendered impossible. The result was, that the most valuable documents and treasures were kept guarded and locked up from the public, for the camera, which could have reproduced the treasures, and placed them within reach of all, was forbidden in the State collections. This exclusiveness has, in the end, brought about the abolition of so absurd a custom. In the first instance, the photographers admitted in the public libraries having only the wet process at their disposal, and taking but little precaution in the use of it, were culpable of many acts of carelessness and injury, and, what is worse, sometimes damaged to no little extent the valuable documents which were entrusted to their care to reproduce; no wonder, perhaps, after this, that it was decided that photography was dangerous, and ought to be excluded in future. But although since then more skill has been acquired, and processes have been modified, so that now dry plates may be used with much certainty, the edict that photographers should not be admitted to the public galleries has remained in force. Some of my readers who visited Paris twenty years ago, and went as far as Versailles to look at the Palace and Gardens of that beautiful suburb, may have remarked before the facade of the Orangery a sentinel mounting guard over that spot, where there was, in truth, nothing to guard. One fine morning a journalist with a thirst for knowledge spoke to the sentinel and asked him the reason for his presence. Getting but an unsatisfactory reply, the persevering enquirer referred to the Governor of the Palace, and at last discovered the reason. It was this: At the time of the restoration of the Palace in 1820 the facade of the Orangery was repainted, and to prevent the public, which on Sundays and fêtes is somewhat numerous, from rubbing against the wet paint and otherwise injuring the work and their clothing at the same time, it was decided to place a sentinel in the vicinity for a short time. But the order having once been given no one troubled themselves about rescinding it when the paint had dried, and the consequence was, that for some twenty-five or thirty years afterwards a sentry still continued to tramp methodically to and fro before the Orangery every day.

There is a good deal of analogy between this anecdote—whose authenticity, by the way, I should not care to guarantee—and that which has taken place in respect to shutting out photographers from the State collections. It has taken some time to get to know why the camera was originally excluded, and now we find that the original cause has long since disappeared. Thanks, however, to the recent decision of the Minister of Public Instruction, any one who desires to reproduce an object contained in one of the public galleries or museums may secure the desired permission to enter the building; he must of course conform to the regulations which have been drawn up for the guidance of photographers, and these contain a clause to the effect that he must always make use of a dry process in operating. Operators must bring with them plates or tissue ready prepared, and must do nothing farther upon the premises beyond exposing their plates, the development and fixing of the latter being conducted subsequently at home. At the present day the conditions to be fulfilled are indeed very easy to fulfil. There is to be fitted up in each establishment a studio where exposures may be made, and this apartment will be so arranged as regards lighting, &c., as to give the most satisfactory results in every respect. Every photographer who is admitted to the privilege must forward to the director of the establishment good negative and two prints of every object reproduced

by him in the gallery or museum. In this case, in the event of the original object being one day injured or destroyed, the State will still be in possession of an exact copy of it. As to the two positive prints, they are to be referred to thereafter in preference to the originals in any case where the latter are not absolutely indispensable.

In this way everybody bids fair to gain by the new regulation. But this is not all. The Minister at the same time has decided that there shall be established in the Ministry itself a laboratory for the preservation of the clichés deposited in the manner I have indicated. In this photographic establishment will be executed all the photographic work for the State, while again it will serve for the instruction in manipulation of those charged by the Government with scientific missions, and also for the testing and verification of any apparatus and chemicals to be sent abroad to missionaries and others. Here, then, is certainly a step which cannot fail to bring forth good fruit.

M. Terperau, the skilful Bordeaux photographer, has devised a means for carrying liquids in the field, which consists of a cylindrical case of cardboard covered with waterproofed canvas. It has the advantage of preserving the bottle from the dangers of collision, and permits one to employ the liquids without soiling the fingers. It is an invention to be recommended to tourist photographers.

An excellent work upon preservatives has just been completed by M. Boivin, who in a letter to me expresses himself upon the subject as follows:—"A preservative little employed, but which, nevertheless, merits serious attention, is tobacco. It rivals all I have experimented with, and gives the most satisfactory results. It exalts the sensitiveness of the plates to a very high degree, and it prevents the plates from fogging and solarisation. Unfortunately, the solution is subjected to sudden change, but the labour of its preparation afresh is compensated for by the beauty of the results furnished. Here is the formula:—

No. 1.—Water	...	...	80 cub. cents.
Ordinary smoking tobacco	...	...	5 grammes.
No. 2.—Water	...	...	20 cub. cents.
Gum arabic	...	...	2 grammes.

The tobacco is first of all rapidly washed in cold water, and after being drained upon filter paper, it is boiled for the space of a minute in eighty cubic centimetres of water in a glass flask over a spirit lamp. The decoction is permitted to cool, and is then filtered. No. 2 solution is added, and you filter again. A piece of camphor may be added (powdered) to add to its keeping qualities, but this addition is not to be recommended. This preservative is poured several times over the film, which has been previously sensitized and washed; the film is subsequently washed again, and permitted to dry. The last washing is very important, for if this is not effected the sensitiveness of the film is considerably diminished. Washing before development is not necessary. To resume: after having essayed the alkaloids, and a large number of basic and neutral substances, as preservatives for bromide films, M. Boivin has found little difference in their preservative properties. What fails, and what is wanted, is an accelerating substance which would endow plates with extreme rapidity. This would, according to him, be some inert organic substance susceptible of absorbing the bromine set at liberty by the chemical action of the luminous rays during the exposure of the film to light.

ERNEST LACAN.

PHOTOGRAPHY AT THE PREFECTURE DE POLICE AT PARIS.*

It is some time since photography has been made use of in the interests of the police and justice. The rapidity of the processes, and the rigorous exactness of the results which the art furnishes, render it too valuable an aid to be neglected. For some time, however, it was any photo-

* *Le Petit Journal*.

grapher, more or less skilled, to whom was left the execution of this judicial work; but the numberless inconveniences of this plan of proceeding caused the camera, after a while, to be used only in the most urgent cases, notwithstanding the great advantages which proceed from its employment.

In 1854 M. Moreau Christophe, then director of the central establishment at Eusisheim, made the proposition that all the prisoners should be photographed immediately prior to their discharge. To the portrait was annexed an account of the individual, biographical notes, and some extracts of the proceedings taken against him. The importance of making a collection of this description may well be imagined; but, nevertheless, no decision was come to in the matter, and it remained in the form of a proposition.

In 1871, at the time of reorganization which followed the disasters of France at the close of the Franco-German war, a man of considerable energy, who had earned the right of making himself heard (M. Lombard, a peace officer), obtained from one of the *prefets*, whose spirit of progression was well known, the necessary authority to form a small photographic service, to be employed upon the most urgent business connected with the police.

A very modest equipment and store of materials were acquired, and the charge of these given over to two police officers, who were detached from their ordinary work for the purpose. A suitable *locale* was secured in a disused police station, and the same properly fitted up. It was not long before the value of this improvement began to testify itself. M. Voisin, who succeeded M. Leon Renault as *prefet*, did not show himself less interested in the success of the new department, and by degrees the staff confided to the care of M. Lombard was augmented, and the establishment soon acquired significant proportions. Work was not wanting for it to do.

At the present moment the photographic establishment of the Paris police includes eight operators, or special employés; it is complete in every way, except that the staff and *matériel* at disposal are still somewhat insufficient, seeing the multiplicity of the work to be performed, and the urgency that frequently marks the operations to be carried out. As to the *locale*, it consists of several apartments in various parts of the building.

There is, first of all, a studio where portraits are taken, in a garret near the *Palais de Justice*, and another in connection with the Morgue; the latter studio is on a terrace upon one of the houses of the quai. At the Prefecture itself, in the quarters of M. Lombard, is to be found an apartment where paper is sensitized, the printing is conducted, and the pictures retouched and mounted; and, finally, a cabinet near at hand contains all the negatives properly classed and put away in big cupboards; these are the archives.

The work going on is incessant, and is executed with an order and precision which nothing seems to disturb. Every evening the Director of the House of Detention sends in the list of individuals who have been remitted to his charge during the day, and whose arrest is provisionally decided upon. M. Lombard extracts from this list the names of all who are known to be bad characters, which are designated assassins, thieves of various character, escaped convicts, and so on. In each case he fills up a form, which serves the prisoner as an entrance-permit to enable him to visit the portrait studio. All these forms are sent to the photographic establishment, and the work of the latter is arranged for the morrow. At an early hour in the morning the work begins, the prisoners filing in according as their names appear on the list. Each prisoner corresponding to the form previously filled in is taken from the House of Detention behind Sainte Chapelle, and, escorted by policemen, he crosses the courtyard, and after numerous detours ascends the stairs which lead to the studio.

Arrived at the studio, the policeman in charge of the

criminal delivers the form in which the man is identified, and all being in order the escort receives a receipt for the prisoner. In less than half a minute two portraits are taken of the model—one full-face and the other profile—and the sitter is then passed on, and another taken in hand.

The process of photographing is a very summary one. The studio has not twenty superficial metres; the roof, very much inclined, is replaced at one side by a glazed frame, which permits a very bright light to pass, striking the model very closely; two operators, one placed in an alcove screened by a dark curtain preparing the plates, and the other in a recess to develop and fix the negatives, work on uninterruptedly, while a third photographer poses the prisoner, and takes two portraits of him. There is always a plate ready, and the lens is always focussed, so that not an instant is lost. The average number of double negatives taken in this studio is from thirty to thirty-five daily.

When the day's work is done, the printed forms are collected, and they are arranged in alphabetical order in long boxes, where they remain until impressions from the negatives have been secured, so that no mistake or oversight can occur. It may be easily guessed of what value are these records, thus taken daily, from a judicial point of view, and as regards public safety. But the functions of the police photographic department does not end here. As soon as a murder is discovered, and the remains of the victim have been transported to the Morgue, a photograph is taken of the murdered man or woman; further photographs are secured of the scene of the murder by the police photographers, in case such representations may hereafter be required in the courts of law for submission to the jury. The acts of conviction are in like manner photographed. Bodies at the Morgue which fail to be recognized by friends or acquaintances are also photographed before they are buried, and these anonymous and posthumous portraits, added to the registry of the lugubrious establishment, place it in the power of the family or absent friends, on presenting themselves afterwards, to recognize a lost friend or relation.

Notwithstanding the disadvantages under which the little staff labours—the surfeit of work, the inconveniences of the improvised apartments, and the unfavourable conditions under which the greater part of the operations are conducted—the results obtained by this new branch of the police force are exceedingly satisfactory, while many of the portraits would do honour to the most skilful photographer. Some views recently taken of scenes made notorious by criminals—those notably of Godfrey's house at Neuilly, of the building in the Rue de Boulogne, the Ducourtieux Pavilion, &c., which measure not less than forty by thirty centimetres—are pictures of a first-class order. In the case of interiors the objects are so dark that recourse is necessary to magnesium light and other artificial illumination; but despite these attendant difficulties the police photographers always manage to secure satisfactory results.

NOTES FROM THE EAST.

BY W. WILKINSON.

As carbon printing seems to be the engrossing topic of the day, I hardly think I can do better than give my experiences in the East.

Within a week of landing in Ceylon, I tried my hand at the production of carbon transparencies. My first essay was to sensitize sufficient tissue to print twelve cabinet pictures, and the first I developed yielded a fine picture, but that and another were all I got from that batch. I set my wits to work, and soon found out where the hitch was, and the next batch was much better.

The next stage was to make some enlarged negatives, to do which I dissected the elaborate enlarging camera that had been sent out from England some two years previously; my dissection consisted of dispensing with about

thirty pounds weight of rackwork, and also of a twelve-inch condensing lens, and the substitution of a piece of coarse ground glass.

En passant, I may mention, for the information of the sceptical, that the wooden bath I brought out with me, lined with Bates's black varnish, answers out here just as well as it did in England, and that one gallon of bath that was in it for one month worked just as well as it did before being put in.

After securing the enlarged negative, my next step was to secure prints by the single transfer process; but here I met with a tremendous check, although I treated the tissue the same as I had done that for transparencies. All went on apparently satisfactorily until I came to the development of the print, when, instead of the backing alone coming away from the final support, the whole of the tissue stripped off, leaving the transfer paper quite clean. Again I had to commence experimenting, and after a lot of trouble I got everything all right, and now can produce prints in carbon with as much ease and certainty here as in England, even now in the hottest time of the year in Ceylon.

When in England, many of my friends who produced their own carbon transparencies were continually grumbling at the pigment in the tissue not being properly ground or filtered, and, as a consequence, the transparencies were full of specks. My first two or three batches were the same, but as I knew the tissue was hardly to blame for all the specks, I carefully filtered the bichromate solution, and also the water used for wetting the tissue previous to mounting the same upon the glass used as final or developing support, and the result was as I expected—transparencies perfectly free from specks or spots of any description, thus pointing at once to the fact that dirty transparencies are the result of carelessness in the manipulations after the tissue leaves the Autotype Works, rather than in the manufacture of the same; and if photographers in experimenting with the carbon process would only bear in mind, when failure ensues upon the first two or three trials, not to blame the tissue, but to alter the mode of working, and to work carefully and methodically, the difficulties of carbon printing would melt away into thin air very quickly.

As regards the tissue, I can say (from personal and from practical experience) that as sent out from the Autotype Works it is always good, and if properly manipulated will produce as good results as that used by the Autotype Company, which, as your readers know, are better than the best silver.

Now I am writing, it may perhaps interest your readers to have some description of photography as practised in Ceylon. Although within a few degrees of the Equator, the thermometer is rarely higher than ninety, and except just in the middle of the day there is not much difference in the practice of photography here and in England—in fact, using Huggon's collodion, I find no difference. Exposures, I fancy, are a little longer here, on account of the violent contrasts. In the dark tent it is very hot indeed, although not oppressive, like the summer heat in England. Coolies (clothed almost in the disgraceful costume of the Greek slave) do the heavy work, and start some time before the operator (he following in a carriage, as it is much too warm to walk far): and as one who always takes charge of the tent has had about ten years' experience, he is a splendid help, getting everything ready for work, and packing up again when work is over, in a style that would shame the most intelligent British labourer, making outdoor work a pleasure instead of being a bore.

One day, in stock taking, I came across a lot of old silver watch cases, and proposed to convert them into silver nitrate, which was soon managed by dissolving in nitric acid; then, after evaporating to dryness, and fusing, I dissolved the residue, and made a solution thirty grains to ounce, a splendid *pea green*; and upon iodising a

portion, and trying a plate, I got a splendid negative, and enclose you a couple of views taken with the identical bath during a gale last week, when the light was none of the brightest.*

On March 30th Mr. A. L. Henderson gave a formula for a developer which hits exactly upon a principle I have been trying to get at for three or four years, but never to my satisfaction, viz., perfect compatibility (in the matter of equal density) between bath and developer. So when I saw Mr. Henderson's formula, I at once tried it, and am very pleased with the result in every way, and so also are three other photographers to whom I have given the formula.

When on my voyage out here, I went ashore at Aden, and called upon a photographer there, and was rather astonished to see a large bottle of distilled water from England to make the negative bath. I set to work, and showed him how to make common water do, by adding a few grains of silver and a few drops cyanide solution to a Winchester of water; and as I had to leave Aden same evening, I left instructions how to proceed after sunning and filtering, viz., adding rest of silver to make bath up to thirty grains to the ounce, and about ten grains of nitrate of baryta; which instructions have been carried out (as a letter I got the other day informs me) with perfect success. This I mention merely to show that cyanide of potassium and nitrate of barytes are perfect remedies or adjuncts, even in the hands of a novice.

TINTED PAPERS FOR PHOTOGRAPHS.

BY J. L. GIBON.

In the course of some details of photography in the late Philadelphia Exhibition Mr. Gibon says, in the *Philadelphia Photographer*:

"I had almost forgotten to make an intended remark in regard to the use of tinted papers. I believe that I have finally come to the conclusion that the pure white surface is the most desirable for photographic purposes. After running in a rut for a number of years, anything that is new is apt to captivate us, and for the time being we imagine excellencies to have been attained that do not really exist.

"Since my return to the legitimate portrait department of our art I have given considerable thought to this one item. In my old practices as a water-colour painter of 'landscapes and seascapes,' I had been taught the habit of first washing over or tinting the papers with some combination of warm colours. The 'principle' was the same as that which induces the photographer to use the pink instead of the white surface. It is claimed that harshness is prevented. I am inclined, however, to fall back upon old authorities, and claim precedence for the purity of the lights. The tinted papers, as we usually receive them, soon become, after being worked, only dirty-looking substrata.

"At one time, years ago, I made rather a pretty class of picture, adapted to the larger size, in which the face, hands, and all of the real lights of the picture were kept perfectly pure, and the remaining portions were stained. Exposing the 'ways that are dark,' I will confess the method then used. After the photograph was printed, toned, and partially washed, I would cover the portions that I desired to remain unaltered with rather a heavy, normal collodion. Afterwards I would immerse the print in a solution composed of an 'extract of madder,' brought to a pinkish colour with a free use of alum and water, heated. Of course, for awhile, the making of the picture was quite remunerative to me, as being a novelty in photography. Others of our brethren, however, commenced to imitate, and stained their papers with all sorts of solutions.

* Two fine instantaneous photographs of a stormy sea and rough breakers are enclosed.

"Their practices were as bad as those of the dry plate workers, because I know that they brought 'coffee, tea, and ale,' into requisition. Some of the results were ludicrous, and the general average of the attempts was bad."

Correspondence.

DALLASTINT.

DEAR SIR,—I have again to thank you for favourable notice of my work.

The only point in the article in your last issue I wish to correct is, that you seem to have a doubt as to the rendering of foliage in landscape. There is not the least difficulty. If the foliage is well rendered in the negative, it must come right in the Dallastint plate or block.

Dallastint typographic is the very same process, with sundry modifications, as the photo-electric process by which the "Kenilworth" subject you presented to your subscribers in 1864 was done.

I have no idea yet of "resting from my labours." I have wished to "crown the edifice" with colour. This I think I have succeeded in doing in my process yclept "Chromo-Dallastint." I have produced by means of it, and in four workings at letter-press, an imitation of a sepia drawing. This is in reality a more trying test than a subject in polychrome. I have experiments in progress in the direction of colour work which will, I trust, convince the most sceptical of the capabilities and value of Dallastint.

Again thanking you for the interest you have always shown in my work, and your readiness to record my progress,—I am, dear sir, yours truly, DUNCAN C. DALLAS.

362, Gray's Inn Road, London, June 18th.

PS.—The sepia subject will be among my exhibits at the Carlton Exhibition.

VOIGHTLANDER'S NEW LENS.

SIR,—Referring to the new lens by Voightlander which I had the pleasure of introducing at the last meeting of the Photographic Society of Great Britain, permit me to state that I did not say, as you have reported, "the new lens resembles the rectilinear;" I said, "in outward appearance it resembles the rectilinear." This statement of course referred only to its size, weight, and general appearance. As the new Euryscopic lens will be patented, the entirely new principle on which it is constructed will soon be made public, and I need hardly say that, as regards its principle of construction and the work it is capable of performing, the new lens is quite unlike any hitherto made by opticians, either in this or any other country, notwithstanding the statement made by Mr. Stuart (Rees and Co.) to the contrary.—Your obedient servant, R. W. THOMAS.

COMMERCIAL DRY PLATES.

SIR,—You have done good service to the photographic world in publishing the correspondence between Mr. H. P. Robinson and the pirate painter of the Dudley Gallery. Half the value of journalism is in the public exposure it gives to roguery and imposture.

There are other matters also of great importance to photographers requiring some ventilation in the journals, and one of these is the number of abominable commercial dry plates issued by some so-called dry plate companies. I saw in your report of the last Liverpool Photographic Society's meeting that some negatives on these plates were shown of great interest as regards the subject, but utterly spoilt by the bad manufacture of the plates. The names of the makers were (unfortunately) not given. It would certainly be well that those who use these plates should communicate to the different photographic societies both the virtues and faults of plates made by the now so much vaunted emulsion.

The best emulsion I have yet found is the Liverpool, which I find quite good after two years' keeping; but I have had lately numerous bad plates from a "company" whose plates were formerly near perfection.

Mr. Warnerke has written a valuable paper in your last YEAR-BOOK on the cause of spots in emulsion, and he put down seventy-five per cent. (as I understand his paper) to preventable faults in the emulsions and in coating the plates. I believe gross carelessness is the cause in those who prepare the plates in most instances.

We have no photographic society in Bedford, the town being in a semi-savage state as regards modern science of most descriptions. When some months since I brought before the notice of the Bedfordshire Natural History Society some dry plate transparencies, carbon prints, and a pocket camera and lenses, the savans of that learned Society appeared to look on these scientific instruments, and pictures produced with them, much as Robinson Crusoe's man Friday looked on the gun which had slain his black brother. I fear, therefore, I cannot look for aid in determining the faults in dry films—commercial or otherwise—in this locality.

Can the Photographic Society of Great Britain (or some other important photographic society) aid a poor outside photographer in such matters as crops of spots, and stars, and other faults in dry plates? For the last eight years I have been a member of the Parent Society, but have not been able to attend more than one of its meetings, and only this year resigned membership.—I am, sir, your faithful servant, Bedford, June 19th. FRANCIS W. TURTON.

PORTABLE STUDIOS.

DEAR SIR,—Having to erect a temporary studio at a place which I visit for three or four months each year, I should feel obliged if you or any of your readers would inform me the best method for so doing. The instrument I use for my work (portraits) is a No. 2a Dallmeyer's, so I require a length of little less than thirty feet for groups. I should prefer a ridge roof, but require the dimension for the light, and the most economical method of darkening the remainder. Could a tent be made ready for throwing over a frame, and what would be the cost?

I would suggest that any of your advertisers having small articles that would come through the post should advertise the price, including postage for the Colonies (Australia and New Zealand), as it is next to impossible to obtain any small novelties from dealers in these places. Apologising for troubling you,—I remain, dear sir, yours faithfully, HERBERT HY. VOULEY.

Westport, West Coast Nelson Province, New Zealand.

[Our correspondent will obtain some valuable hints from a letter in a recent number.—Ed.]

INACCURACY IN PORTRAITURE.

SIR,—I watched the last two weeks' issues of the News with much interest, hoping your article upon "Inaccuracy in Portraiture" would elicit a good deal of discussion, considering its great importance; but to my surprise it seems to have attracted no notice whatever.

Being engaged very largely in photographic portraiture, I have many opportunities of verifying all that your correspondent states; and so great is this difference between prints that it occasionally happens that a customer will select from a parcel of cartes and cabinets all the long or broad faces as the case may be, and return them with many sarcastic observations as to the so much talked of "truthfulness" of photography.

This appears to be almost entirely a paper maker's question, but unless some remedy is devised by the manufacturer or albumenizer, I fear that, between excessive retouching, and this far worse evil of unequal expansion and contraction, our art will fall into such disrepute that a return to the old silhouette or scissor-type will be almost preferable.

Perhaps some plan analogous to Mr. Sutton's method of resinizing, previous to albumenizing, might be found efficacious.—Yours, &c.,
JANUS.

Proceedings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The new Board of Management's first monthly meeting was held at 174, Fleet Street, on June 7th.

The minutes of the third annual meeting having been read and confirmed, the election of the following gentlemen took place:—Mr. Cassinello as honorary member, Messrs. Green, Alder, and Milliard as ordinary members of the Association.

A resolution was then brought forward, proposed by Mr. J. Fage, seconded by Mr. Sisman:—"That all members' subscriptions, whether honorary or ordinary, shall date from the first day of the month in which they were elected, and be payable in advance. The Secretary to notify members to that effect as their subscriptions become due."

Proposed by Mr. Sisman, supported by Mr. Fage—"That the Secretary shall forward all monies above a stipulated amount to the Treasurer on the second Monday in each month."

The members of the Sub-Committee elected to carry on the duties of secretary, pending the election of secretary, then presented their balance sheet. After being carefully audited, the meeting passed it as read; thereupon the books, &c., were handed to the new officer.

After grants had been voted for the several purposes of the Association, a vote of thanks was tendered to the Sub-Committee. The meeting then adjourned till Thursday, July 5th.

Talk in the Studio.

POPULARIZING CARBON PRINTS.—We have received from Messrs. Wolsenholme, of Blackpool, a hint of the method they are adopting to popularise the "chromotype" or carbon print. They issue a circular briefly explaining the claims to permanency of the chromotype, and enclosing for acceptance a charming example. The prints used for this purpose are preferably pretty portraits of children. These are generally preserved and placed in an album, where, as a rule, they contrast favourably with the silver prints—probably many of them more or less faded—and so prove an admirable advertisement.

"TISSANDIER'S HAND-BOOK OF PHOTOGRAPHY."—Messrs. Sampson Low and Co. have in the press, and will publish shortly, a second and revised edition of "Tissandier's History and Hand-Book of Photography." Besides containing a more complete account of the part belonging to Englishmen in the discovery and improvements in photography, there will also be an additional chapter by the Editor, embodying the latest results obtained in the various branches of the art, thus bringing the work down to the present time. It will also contain, in addition, specimen prints by the "Woodbury," "Permanent Ink," "Lichtdruck," "Albortype," and "Zinc Processes."

IMPROVISED BURNISHER.—A correspondent of the *English Mechanic* says:—"Amateurs who have not a photo-rolling-press can put a first-class gloss on their C.D.V. by the following means:—Got from an ironmonger or zinc-worker two pieces of sheet zinc, size about 4½ inches or 3½ inches (it will have a splendid polish if new, and cost about twopence); screw your wauling or wringing-machine rollers down, place your C.D.V. between the zinc plates, and roll the same between the rollers. When the C.D.V.'s come out you will find that they are glossed. If you warm the top plate, you will find a superior gloss on. If you get two polished steel plates you will be able to gloss your C.D.V. equal to any rolled with a photo press. You can get a finer gloss by warming the plates. If you should be out photographing, and spill part of your sensitising solution, so that the plate is not covered, you will find that by placing two or three clean glass plates behind the dipper your solution will cover the plate. Of course you can dilute your bath a little, too."

A NEW PHOTO SCULPTURE PROCESS.—In the United States Army Department at the Centennial there was exhibited a handsome model of the Rock Island Arsenal. It is to be regretted that this work of art did not bear some description as to the manner in which it was produced—an explanation of

which we find for the first time in the recently issued report of the Chief of Ordnance of the United States army. From the various buildings, it appears, positive photographs were obtained, representing all their different sides. Each view was then exposed over a thick film of sensitized gelatine, covering a glass plate, and afterwards the soluble, opaque portions of the gelatine were washed out. The film was then swelled by a peculiar process, so as to magnify its differences of level, until a suitable relief was obtained; and a plaster cast being taken of the film, it gave a permanent mould from which many repetitions could be made. A successive series of these plaster views, taken from the different sides of a house, were mitred together at their edges; and when roofed in they formed a perfect reproduction of the house itself, every stone and crevice being represented. In one building the slats of a lattice work around the piazza were plainly exhibited, in lines not over 0.006 inch in width. The model was made by Baron F. Von Egloffstein, of this city.—*Scientific American*.

To Correspondents.

KLARY'S SYSTEM OF LIGHTING.—We continually receive enquiries regarding the pamphlet which M. Klary, of Algiers, offers to photographers, describing his system of lighting. Two correspondents make enquiries this week. As M. Klary's system is supposed to be a secret, we could not with propriety publish details, even if we had his pamphlet before us. We have not, however, seen it, and only know of his plan from the information sent by various correspondents. We understand that M. Klary's system depends chiefly on the use of portable screens, and on page 126 of our last volume we gave full details of the use of screens after the fashion in which we understand they are employed by M. Klary. As to whether the pamphlet is worth the fifty francs charged for it we are not in a position to say; nevertheless, we believe it contains many valuable hints.

W. W.—Ammonia sulphate of iron is doubtless meant.

TISSUE.—By the use of a revolving background a peculiar softness and atmospheric quality in the background of the picture are supposed to be secured. There are various modes of securing the revolution. Sometimes a rapid touch of the hand secures sufficient revolution for each sitting.

J. M. G.—D.—See an answer above.

J. J. T. G.—The spots on the negative are doubtless due to turbid particles at the bottom of the bath, stirred up, and brought into contact with the film whilst flashing out the plate which had slipped off the dipper.

B. F. M.—Either loaf sugar or crystallized sugar-candy will answer; about thirty grains in each ounce of the developer. It acts as a restrainer both mechanically and chemically. Some years ago we reported a somewhat extensive series of experiments with various forms and proportions of saccharine matter in the developer. Treacle acted as a most powerful restrainer.

M. D.—The addition of glycerine to the nitrate bath materially checks the drying of the film in long exposures. It is important that the glycerine should be pure, and that the bath should not contain free nitric acid. Failing these precautions fog is apt to ensue. No fixed proportion has been settled. We should try a small quantity at first, and add more if necessary. One ounce of glycerine to a pint of silver solution would be a good dose, we should think. Wet blotting-paper placed at the back of the plate has been found useful.

TROUBLED.—We could have given you a more certain opinion if you had sent an example of the trouble; but from your description of the faint flat print it seems probable that the paper has been too dry when placed in the frame. If sensitive paper is used absolutely bone dry, and the pads placed at the back of the paper are in the same condition, printing is slow and imperfect, the image being faint, grey, and flat. The paper must not be so damp that it will stick to the negative, neither must it be absolutely desiccated.

G. D. (Yarmouth).—There are no means of restoring old insensitive collodion to its pristine sensitiveness. It may be improved by the addition of a bromide, say to each ounce of collodion one grain of bromide of cadmium. The best mode of using such a collodion to advantage is to add a little of it to a new colourless collodion, which is often apt to fog. A small portion of the older sample is often a great improvement.

W. DAVEY.—Thanks.

F. NAIEN.—New Zealand. We will institute enquiry. The fault is, we fear, with the colonial postal authorities. The copies are all duly posted here. We will hand your instructions and remittance to the publisher, and see that they receive attention.

JAMES H. CORSCADEN.—Inquiries are made for address, which did not appear in the communication made in our columns.

Several Correspondents in our next.

The Photographic News, June 29, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

FRANZ HANFSTAENGL, PHOTOGRAPHER—OUR CONVICT SITTERS.

Franz Hanfstaengl, Photographer.—The particulars of Hanfstaengl's life furnishes one more corroboration that success in photographic portraiture depends upon the photographer possessing art ability. Too often has the value of art knowledge been under-estimated in photography, and there are those who would have us believe that things photographic cannot be artistic. No picture secured in the camera can be, in the eyes of some people, a work of art at all; but let the photograph be accurately copied with the brush, as was the case with one of Mr. H. P. Robinson's pictures at the Dudley Gallery lately, and then there is no reason why it should not be received in any art gallery in the world. Those practised operators, again, who scorn having anything to do with art, and deem it quite sufficient if they supply the public with cheap and shining portraits, may also be assured that they will never get beyond a certain barrier, unless their pictures are executed in accordance with the canons of taste, for, look where you will, the portraits which have made the most way in the world will be found to emanate from men who are artists before they are photographers. Some time since we referred to this fact in these columns, and cited the cases of half a dozen men of European reputation who showed that they were all of them capable artists with pencil or brush as well as with the camera. Hanfstaengl, whose death took place two months ago at Munich at the ripe age of seventy-three, was no exception to the rule. His name, especially ten or fifteen years ago, was a household word among German photographers, and there were not many in this country who had not heard his name and admired his work. Hanfstaengl was known everywhere, and English visitors coming back from the Fatherland with portraits of themselves or friends, pictures taken in Dresden, Berlin, or Munich, served to keep the name fresh in the memories of those who could appreciate good work. The familiar name of Hanfstaengl was met with more frequently than any other upon the charming little *cartes* that reached this country from Germany, and the success of the artist may be guessed from the establishment in his name of different studios in several cities of Germany. Hanfstaengl made a way in this world for himself, and, as the *Art Chronicle* of Germany says, from an ignorant peasant lout, worked himself into a finely-cultured cavalier. He held the position of Hofrath, equivalent almost to the rank of a privy councillor with us, and had received much attention from the Prussian Court, King William the Fourth presenting him on one occasion with a snuff box with the Royal likeness upon it set in diamonds. This gift appears to have been of some value to the artist, for during the unfortunate time of 1849, when Hanfstaengl resided at Dresden, the ringleaders of an *emeute* were traced to his house, and he among others were led out by the Prussian soldiery to be shot. At the critical moment he bethought himself of the Royal present, and handing it to the officer in charge of the party, begged the latter to return the gift to his Royal master after Hanfstaengl's death—a proceeding which at once caused the release of the prisoner. Hanfstaengl, it appears, was born on the shores of one of those pretty lakes which constitute the southern portion of Bavaria—so charming a holiday ground—and came to Munich in 1816 an ignorant peasant boy. Resolved to make his way in the world, he attended the drawing and art schools in the town, and at the age of twenty-one was fortunate enough to attract the attention of Senefelder, who was, as our readers know, the discoverer or inventor of lithography. Hanfstaengl's art knowledge and skill as a draughtsman at once made him an apt

assistant, and in 1834 he journeyed to Paris, there to study Lemercier's method of printing from stone. Returning to Dresden an accomplished artist and lithographer, the idea struck him to reproduce the principal objects of art in the Dresden Gallery by the aid of the process he understood so well, and the King of Saxony having given his sanction, Hanfstaengl set to work to copy some of the principal cartoons and pictures upon stone. That he was, however, something more than a clever copyist is proved by the circumstance that he drew in his lifetime thousands of portraits direct upon stone, many of which rank among the highest works of this class. Few artists, indeed, could secure so rapidly and effectively the features of a model, for he at once seized the main points of a portrait, while at the same time he knew how to do so in a highly artistic way. Hanfstaengl was one of those to busy himself with the electrotype process, and established in Munich, between which town and Dresden he seems to have spent most of his life, an electro-typing atelier, therewith further to reproduce objects of art; and it was while so engaged that the advantages of photography struck him. He forthwith gave some attention to chemistry, in order the more to understand the manipulations of the process, and his art-education at once placed him in the first rank of photographers. As a reproducer of oil-paintings by photography he won a high reputation, this branch of the art being, as every photographer knows, a peculiarly difficult one, while, as we have seen, as a portraitist, he was simply *facile princeps*. It may be mentioned that in the reproduction of some works from the old Pinakothek in Munich (one of the chief State Galleries), Hanfstaengl was pronounced to have succeeded better than other twenty-two competitors in the matter. It is something to know that his labours were not in vain from a commercial point of view, for although we possess no information whatever on the subject, we feel sure that, in a business sense, as well as in that of art, he was a successful man. It is impossible that a photographer who enjoyed a European reputation, and whose pictures were to be frequently found in albums throughout this country, could have failed in securing for himself and his family a comfortable fortune. We are glad to hear that he leaves behind him those who, by reason of their artistic ability, are competent to maintain for the name its present honourable position.

Our Convict Sitters.—Some of our readers may be struck with the account which we published last week of photography as it is practised by the police at the Prefecture at Paris. It is a commonly conceived notion that you cannot photograph a man without his will, and with prisoners, it would be generally supposed, some resistance would be offered. But in the account we published, and which is translated from a popular Paris journal, *Le Petit Moniteur*, there is not a word to lead one to imagine that the prisoners resented the process of having their likenesses taken. In fact, no time seems to be allowed for any such contingency, and the criminals are filed into the studio one after another in quick succession. The operator is standing with a double plate in his hand, and apparently before the prisoner is well aware what is going on a front view, and one in profile, has been secured. It would be interesting to learn whether in this country there is now less opposition than formerly on the part of prisoners to be reproduced by the camera, for, if we remember rightly, some particularly clever contrivances were resorted to, in the early days, to overcome the occasional shyness and backwardness evinced by models to sit for their portraits under these circumstances. Now we believe the practice has been hit upon to have the picture-taking done immediately before dinner, and the early distribution of this meal thus depends upon the resolution of the prisoners to get over their scruples to sit still in the posing chair. But we fear that the British convict has not yet learnt to treat the affair with such equanimity as his French brother evidently does.

NOTES ON THE THEORY AND PRACTICE OF EMULSION PROCESSSES.

BY HERBERT B. BERKELEY.*

I SHALL be glad if the foregoing remarks on some of the theories connected with emulsions receive plenty of criticism from the members present this evening. If photography has hitherto advanced so rapidly, may we not expect even greater things when its mode of working is thoroughly understood? I will now leave this part of the subject, and make a few remarks on emulsions from a practical point of view.

Of course an emulsion cannot be too rapid, provided it work in a satisfactory manner. A very good quality of collodion emulsion may be made by a formula of Captain Abney's I published a short time since in the *British Journal*. The zinc bromide gives a very opaque film, most valuable for preventing blurring, and doing away with the necessity of backing or dyeing the plates. It is worthy of notice that Captain Abney obtains by his method an emulsion perhaps three times as sensitive as those I have prepared when presumably following his instructions. We have not yet been able to account for this difference; and I hardly think the methylated spirit can be the cause, as it gave with gelatine as sensitive a film as the rectified alcohol. I have prepared an emulsion without albumen, and another with two grains of albumen to every eight grains of pyroxyline, yet I do not find there is much appreciable difference between them.

My emulsions are very opaque; and if the film be partly dissolved by hyposulphite of soda it is easy to see that the colour by transmitted light is orange. Captain Abney's films incline to blue; they transmit the green rays, and he contends that his films contain a finer silver bromide than mine do, and that, consequently, they are more sensitive. My emulsions, however, are more easily worked, density being obtained with the alkaline and the hydrosulphite of soda developers, the latter being used as I shall direct. Good results are obtained by mixing the two kinds of emulsion together.

If the albumen should act by causing a fine silver bromide, I find it difficult to account for the thinness of image which Captain Abney's own preparation gives, for fine silver bromide should give a dense image. It seems to me that there must be some other difference between the two kinds than that of the relative fineness of the silver bromide. I am not able to speak positively as to the characteristics of these two forms of emulsion; but Captain Abney, who has tried my emulsion, assures me that my results are entirely different to those he obtains. When making this emulsion, I sometimes find that the silver bromide is formed in large clots, which emulsify shortly after the addition of the excess of silver nitrate. This effect is usual when iodide is present in the emulsion; but with plain bromide it is new to me.

It is at the washing stage that one is liable to fail. Widely different have been the methods recommended—from precipitating the emulsion in water to adding glycerine and allowing to set thoroughly. The process which has gained the prize of the Photographic Society of France includes the former method, though certainly the pyroxyline is precipitated *before* using it in the emulsion. There is no doubt that the quality of pyroxyline has much to do with the result, some samples bearing a treatment which would ruin others. Before the days of washed emulsion, I made several experiments with precipitated emulsion, but the method did not answer well enough for practical use. Even now, when adding glycerine, and allowing to set quite firmly—I may almost say "hard"—I have prepared emulsions which gave films liable to split in all directions when dry. The loss during washing may be about three per cent. It is best to add some gum-ammoniacum solution to such emulsions, and to keep them for a week or two, when they will probably work more satisfactorily.

Though I have experimented a great deal with gelatine emulsions, I must own that I do not like them so well as collodion. I do not think that they are so manageable in any respect as collodion emulsion, and there is much uncertainty connected with their keeping, and with drying the plates. Gelatine has the advantage over collodion in that the ether fumes are absent, and the rapidity is generally greater; but in every other respect collodion is more reliable.

I have experimented considerably with alcoholic gelatine emulsions, but without much success, finding that the bromide is precipitated when over (say) fifty per cent. of alcohol is added to the watery emulsion, and it is difficult to get an even film. The bromide appears to remain suspended best in those solvents in which it has been formed.

I also found that if excess of silver be used it is necessary to add it *after* the addition of the alcohol to the washed emulsion, otherwise it is not possible to use so much alcohol without causing precipitation of the bromide. Again, the addition of silver nitrate to the alcoholised gelatine emulsion causes a precipitation of the bromide, and sometimes of the gelatine as well; the former re-emulsifies on converting the nitrate with a soluble bromide. I may say that these results are nearly instantaneous.

I am much pleased with what I have seen of the new developer—hydrosulphite of soda. With the sample of bisulphite I have used, I find the following method successful with the plates I prepare by Captain Abney's formula:—

Make a stock solution of—

Bisulphite of soda	...	...	1 ounce
Sulphite of soda	...	...	80 grains
Water	...	...	4 ounces.

Pour some of this solution into a bottle of granulated zinc; in about half an hour decant into another bottle, rinsing out the zinc several times with water, which, of course, throw away. To moisten the plate, I use a saturated solution of hyposulphite of soda in alcohol sp. gr. .823, with ten grains of tannia added per ounce; the plate is then rinsed, and sufficient of the hydrosulphite solution, with four grains per ounce of pyrogallie acid added, is flowed over the plate. The development is slow, no image appearing for two or three minutes, so that a developing dish is useful. I find the sulphite of soda a great advantage; if left out, only the high lights take on sufficient density.

This developer gives a good range of half tone, and does not clog up the secondary lights, as is so commonly the case with the alkaline developer, if printing density is sought by its use.

I may say that the developer may be used alkaline with ammonia, in which case the density is obtained without the sulphite of soda, but the peculiar character of the image is easily destroyed.

The developer appears to act in the ratio, or nearly so, of the actinic effect, and I have no doubt will be particularly suitable for cloud negatives.

I will now conclude this somewhat lengthy paper with the hope that I have not quite exhausted the patience of my hearers. I have had much pleasure in introducing this subject, and I now leave you to pick as many holes as you possibly can in the theoretical matter in the first portion of this paper.

PHOTO-STEREOTYPING (PHOTO-ENGRAVING).

A SUBSTITUTE FOR WOOD ENGRAVING.

BY DR. ADOLPH OTT.*

FOR some time past an invention has elicited great interest among photographers, artists, and publishers, by which it is possible to produce a relief plate in metal of prints and

* Continued from page 292.

* A paper read April 26th, 1877, before the Polytechnic Association of New York.

engravings in as many hours as it would occupy the most skilful wood engraver days and weeks. Like many other wonderful discoveries of modern times, this new invention is an offspring of the "black art," photography, and if it will not completely replace the art of Albrecht Durer, it certainly will prove an inestimable boon wherever quick and accurate reproductions of illustrations of any kind are wanted. It is entirely independent of the wood engraver, which is in so far of advantage, as he often fails to give a facsimile of a drawing, while the new process, in being dependent only on chemical and physical laws, is bound to give a perfect copy of any picture or sketch that may be desired; and, although manual labour is not entirely dispensed with, it is reduced to a minimum, being confined to the mere operation of "finishing," viz., to the deepening of wider spaces and the touching up of any portions which may not have come out sufficiently perfect. Or, in other words, the tool of the engraver has become a mere auxiliary instrument, while on the other hand an infinitely greater amount of work can be executed in the same time.

The first impulse to this important invention was given by a seemingly insignificant observation made in 1839 by the Englishman, Mungo Ponton. This investigator discovered that paper which had been soaked in a solution of a chromic salt and dried was rendered sensitive to light, viz., that light coloured it. If an object is placed on paper thus prepared, the parts exposed to light soon assume an orange tint, while the covered parts retain the original colour. On washing with water a white image on orange ground is obtained; that is, the parts exposed to light remain insoluble, while the others are being removed. Mr. Becquerel, the celebrated French physicist, shortly afterwards investigated the action of chromic salts on organic substances under the influence of light, and arrived at the conclusion that the colouration and insolubility were due to the reaction which took place between the chromic salt and the gelatine (sizing matter) in the paper, as in using unsized paper no effect could be produced.

Fox Talbot, in 1852, based on this discovery a method of photo-engraving, or a heliographic process. On a steel plate he spread in the dark a mixture of chromic salt and gelatine, allowed it to dry, and exposed it under a positive cliché to the sun's rays. Now as to the question what took place, we may state that below all those parts through which the light could pass freely the gelatine was rendered insoluble, while under the opaque lines it remained soluble. Such a plate, on being immersed in water rendered a true facsimile of the drawing in the layer of gelatine, the metal being laid bare and forming the ground. It is evident that, by pouring an acid liquid on the plate, the parts laid bare would be bitten in, thus giving an exact copy of the photograph, from which prints may be struck off as if the drawing had been engraved by the artist himself.

Mr. Pretsch, an Austrian, did not rest content at this point. His idea was to produce a relief plate, not a steel engraving, but a substitute for woodcuts, to be set up with type in the printing press. He could not have failed to notice that a sensitized gelatine film, on being treated with water, swells slightly in the parts on which the light has not acted, while it remained unaltered in this respect in the parts affected by the light. This is simply owing to the fact that gelatine will retain its property to absorb water where the light could not act, while it will be deprived of it wherever it has become insoluble. Here, then, we have a substance of which the reliefs and depressions correspond to the lights and shades of the photograph. From this Pretsch took an electrolyte in copper, which represented the image in intaglio when a positive cliché had been employed, and in relief if the sensitized film had been exposed with a negative. However simple this process appears in theory, the difficulty is in practice. The gelatine film is likely to swell still more in the electro-metallic bath (a copper solution), losing its form, &c.; in fact, in spite of all the ingenious devices, the process failed to produce commercial results.

It may be that the great number of artists who are at the disposition of publishers and illustrated journals in the Old World, as well as the prejudices which this innovation met, have also been among the causes that prevented the Austrian inventor improving on his method. But, supposing even the practical difficulties could then have been removed, it is yet doubtful whether an invention of that kind would have found the necessary encouragement on the other side of the Atlantic. To a keen observer it would seem that the United States offered a more proper field, for that is pre-eminently the land of periodicals, illustrated literature, and reprinting. The commercial world also takes advantage of illustrated catalogues and price lists in a much greater degree, and we see the large firms actually overbid themselves with publications of this kind. No doubt such were the considerations that presented themselves to the gentlemen of the "Photo-Engraving Company" (Mr. John C. Moss), and the "Photo-Plate Engraving Company" (Mr. J. Oesterreicher), the latter of whom is a pupil and countryman of Pretsch, and led them to improve the said invention, and to try with it their fortunes here. They have both solved the problem, and it is not exaggerated if we say that they have thus formed a connecting link between the most important invention of ancient times, the art of Guttenberg, with one of the most interesting inventions of modern times, photography. *(To be continued.)*

GERMAN CORRESPONDENCE.

CARBON PRINT IMPROVEMENTS—MACHINE FOR CLEANING PLATES—SUBSTITUTE FOR SUNLIGHT—ELECTRIC LIGHT—SIMPLE METHOD OF ENLARGEMENT—RESULT OF THE TRANSIT OF VENUS OBSERVATIONS—A NEW INVENTION.

BY DR. VOGEL.

THE carbon process still claims the most lively attention of photographers. But the number of those making in reality carbon prints for the public is, indeed, a very limited one, for the difficulties of the process do not encourage a person to join this small number, and there is a want of operators who understand the process. There is, however, much in favour of the carbon process. It produces fine glass pictures in a more simple manner than collodion-chloride of silver; it permits the reproduction of negatives; it delivers durable pictures, and this point is of importance for some purposes, although with some pictures we should not like a too long extent of durability. Every photographer, even if he has not the intention of giving up the silver print, is obliged to take notice of the carbon print, a circumstance rendered more difficult by certain patents. It is certain that some remaining difficulties will be overcome as soon as more photographers make use of the process. One of the greatest faults of the process, which more especially troubled American photographers, was the difficulty of sensitizing and drying the paper in warm summer weather, for often the gelatine, loosened in the chrome-bath or the carbon coating, runs down while drying, and very often the time of drying was such a long one that the coating was decomposed and spoiled. These adverse circumstances can now be prevented by applying alcohol. Boivin proposed at first to add alcohol to the chrome-bath. I have tried it, and succeeded very well. I took

Water...	...	...	...	75 c.c.
Alcohol	...	...	...	25 c.c.
Bichromate of potassium	...	...	...	3 grammes

This bath loosens the gelatine much less than the pure water bath, and thereby a great difficulty is considerably reduced. Besides, the glycerine contained in the paper is less dissolved, and the paper remains more pliant. Boivin asserts that paper sensitized in an alcohol bath dries quicker; and, indeed, it requires only three-quarters of the time that paper prepared in a water chrome-bath does. We can shorten the time of drying by putting the paper after sensitizing in strong alcohol for about five minutes.

Then it will be dry in one hour. This method permits working as quick with carbon tissue as with albumen paper. I sensitize in the morning at nine o'clock, and at four o'clock in the afternoon I have finished some pictures. Although the drying of the carbon tissue takes a little longer time, the time of copying is only one-third that of the silver-printing process; and even carbon prints with double transfer can be ready just as soon as silver prints, which, on account of a most careful washing, have to remain in the water over night.

I must mention a new step forward in the process of cleaning plates. The photographic chemist, Grüne, at Berlin, is cleaning his plates by a machine, which consists of a wheel, on which is fastened a kind of brush all round, and beneath it the plates are moved along by a pusher. The wheel is turned by hand, and the plates, before putting in, are daubed with a dough of infusory dust and water. This infusory earth is found abundantly in the Lüneburg Woods, and forms a porous and very fine and soft silicious earth, which readily absorbs liquid stuffs. In this manner we succeed, indeed, in cleaning plates which otherwise cannot be cleaned.

The spring has brought us so far only storm and cloudy weather instead of sunshine. It is a pity that the surplus of sunshine in America cannot be filled in barrels and sent to us; we would pay a good price for it. We are hunting yet for some substitute for sunlight; inflammable gas, magnesium light, electric light, &c., are applied for preparing enlargements. Recently the greatest attention has been directed to the electric light, since Dr. Siemens, the renowned "electrician," has invented a new magneto-electric machine, which, kept in motion by an engine of four-horse power, produces an excellent light. Such a machine is in use already in the atelier of Mr. Winter, at Prague. I had occasion to test this light photometrically, and have found that it can completely copy, without reflector, a carbon print in seven minutes, at a distance of nine inches, which shows that its effect is the same as the burning of one-third gramme of magnesium wire. The price of such a machine is about \$1,000, and, therefore, the photographers, in order to save this expense, are searching for a cheaper method of manufacturing enlargements without sunlight. Mr. Liebmann, of this city, a young and skilful photographer, operates most successfully in manufacturing enlargements by means of collodion without a camera. He has a small room right under the roof of the house. Through the ceiling of the same he made an opening, in which he placed horizontally the negative to be enlarged. Vertically beneath it he has fixed a portrait objective, which throws an enlarged picture of the negative on a table standing under the objective. On the table he puts the collodionized and sensitized plate. Camera, cassette, &c., are not necessary, for the diffused light of the sky is sufficient for enlargements. The plate can be sensitized and developed in the same room, and the whole concern is a very convenient one. By this process he receives, of course, at first a positive; but Mr. Liebmann prepares from this a negative with little trouble; that is, he copies from it a carbon tissue in a printing-frame, which he transfers on glass. In this manner he receives a negative which is to be put two minutes in a solution of one part permanganate of potash in five hundred parts of water. By this it is strengthened, and delivers excellent copies on albumen paper, which can hardly be distinguished from pictures directly taken.

Three years have elapsed since the observation of the transit of Venus, and we have heard but little about the result, and what we hear is not good news. The measurement of the French Venus plates has shown no sufficient results, though the preparations had been most carefully made. About the results of the English, American, German, and Russian expeditions we hear nothing yet, but it would be gratifying if they could make favourable reports.

The German Reichstag is deliberating now about a

patent law which will be similar to the American. When that is published we shall be overwhelmed by photographic patents. A new invention is already advertised in the papers, which makes a great sensation; it is called "Poykylo-photography." What that means I do not know: certainly the name is something new, and, of course, qualified to impose upon the public who understand nothing about the affair. The pictures are nothing else but photographs made transparent in some way, and then coloured on the back. The latter is done very skilfully, which produces the effect of the pictures, not the process itself, which in similar manner was executed already by Braun at Dornach, Wunder at Hanover, and others. My friend Priimm, the Vice-President of our Society, went over to Dresden, and has seen the pictures. He had also the honour to become acquainted with the inventor, the poykylo-photographer, Mr. Schuhmacher, and found out the sum which he is asking for his American patent, namely, \$80,000.—*Philadelphia Photographer.*

SHOWING PROOFS A NEW WAY.

BY FRANK L. STUBER.

SOME discussion has recently been printed in our spirited contemporary, the *St. Louis Practical Photographer*, on showing proofs, and Mr. Stuber sends the following:—

"Having read your very interesting article in the *St. Louis Practical Photographer*, on the abuse of the showing proof system, I thought I would give your readers a little novelty in that way which I am practising in my gallery at the present time. I find the system takes, and gives general satisfaction. After studying the matter over some time, and experimenting, I hit upon the following plan, by which we can get rid of so many sittings. I have succeeded very well, at least it works splendidly in my gallery. I make my negatives same as usual, four and a quarter by six and a half plates (for card photographs) that size. I am only working at present in this way:—When the negative is developed and fixed, set it on a piece of blotting paper for a few moments to drain, at the same time have a sensitized quarter plate in a small dish or bath-holder; now lay the negative on a table, put two strips of thin cardboard on each side, and lay the sensitized plate on the top, film facing; next, I have a small window in my dark room, in which place a con, which projects outside. At the outer end have a small hole or diaphragm, about one-fourth or one-half inch opening, covered with mineral, tissue-paper, or ground glass. On the inside I have fastened a plate-holder, into which place the two plates, which are held there with a spring. I now pull the slide and expose through the negative for a short time, then develop and wash. I now have a transparency which is far superior to a paper proof, as a general thing. Do not fix the transparency, as it shows to better advantage, and the work is done quicker. Now take it out and lay it on a retouching frame, and cover it with an oval, or any shape matt, then invite the sitter to examine it. I now have the advantage of listening to the criticism, and can correct wherever I see that I can improve the negative by retouching or printing. The great advantage is, that the operator will be more careful in making his sittings, so that he will not have to make a re-sitting. When the transparency is satisfactory, the negative can be varnished, and immediately handed to the retoucher, thereby saving a great deal of time, and the work will be finished so much sooner. At first sight you might think that the sensitizing will cost more than to make a paper proof; but I say not. Now, if you make a paper proof, your negative has to be varnished, the proof printed, turned, &c. The customer takes the proof home, and it is compared with a finished photograph, criticised by those who do not understand anything about the work, or how it will look when finished. They will say, "You had better try again, and then we will take our choice." And

nine times out of ten they will take from the first proof. If the sitter is to be retaken, the operator will very often have to work according to the customers' ideas, thereby making many failures, for every operator should understand best how to produce his work satisfactorily.

"Further experiments show that the positive will be much clearer if the negative is not drained, but exposed immediately after it is washed."

The editor of the *Practical Photographer* says:—

While on the proof business, we will give you more proof that the whole system is a nuisance. We would call attention to an extract from a letter we have lately received from J. W. Bankes, of Little Rock, Ark. Mr. B. ranks high in our profession, being a number one artist; has a fine gallery, and the best class of customers:—

Dear Fitz,—I was glad to notice in your January number an article condemning the showing of proofs. It is high time photographers were taking some decided stand against so degrading a practice. I never do it in my business, and when asked to do so, always peremptorily refuse. I take all possible pains with the sittings, but when I have done the best I can, and think the work good enough to send out, I expect to be paid for my labour. My patrons generally understand this, and hence I have very little trouble on that score.

Occasionally, some unreasonable and hard-to-please individual will attempt the "bulldozing" process, by refusing to sit unless he can see proofs; in such cases I let him go, and consider myself well rid of a troublesome customer.

A lady (?) applied to me for a sitting a few days ago, and stated that she had sat *ten* times at some other gallery, and they had made her proofs, but she would not take any of them. I replied—"Madam, the best thing you can do is to go back to the other gallery, and give them an order; they are surely entitled to some remuneration."

Another lady entered my studio with a child. "Do you make proofs?" "No, madam," was my reply. Her response was the usual one: "They make them at other galleries." The January number of your journal above referred to was lying near, so I turned to the article on proofs, and said: "Please read that, madam." She seemed to read it carefully through, and then said: "I believe he is right." She was much pleased with her child's pictures.

I think photographers who desire to introduce such reforms would find it to their advantage to show such articles to their patrons now and then. It seems to convince them that you are not alone in the position you have taken. And whenever they begin to suspect that there is a general movement in that direction, the battle is more than half won.

If photographers would enjoy the respect of the community in which they live, they must begin by respecting themselves.—Yours very truly, J. W. BANKES.

NEWTON'S SAL-SODA* DEVELOPER AND THE LIVERPOOL DRY PLATES.

A CORRESPONDENT of the *Photographic Times* writes as follows:—

This developer, recommended by Mr. H. J. Newton, President of the New York Photographic Association, has given me better results than any other I have ever employed in the treatment of emulsion wet or dry plates. I have found it especially valuable for what is known as an extra-sensitive dry plate, because it supplies the much-needed intensity. All who are at all familiar with the working of emulsion wet or dry plates are aware that just in proportion to their sensitiveness they develop weak, almost invisible, and quite unsatisfactory; that to

secure a good printing density dry plates must be so made up as to require an exposure four or five times longer than wet bath plates. But this sal-soda developer gives the requisite intensity to the most rapid dry plates.

A year and a half since I imported twelve dozen of the Liverpool extra-sensitive dry plates. They greatly disappointed me. They were very rapid, but the image, developed according to the directions sent out by the Liverpool Company, was painfully weak and unsatisfactory. After repeated trials I laid the plates aside as about worthless, thinking they had perhaps been damaged by dampness in their transit across the Atlantic. After the lapse of a year I again tried them, and notwithstanding the uncommon heat and dampness of last summer, I found them as sensitive, or perhaps more sensitive than at first, but still as weak as ever under the ordinary alkaline pyro developer. I then tried upon them Newton's sal-soda developer, and, to my great surprise as well as delight, the image came out clear, strong, and round. And this developer I continue to use, not only on the Liverpool, but other emulsion wet and dry plates. The following is the formula:—

No. 1.—Water	16 ounces
Sal-soda	2 "
Bromide of ammonium ...	40 grains.
No. 2.—Aqueous solution of pyro (say)	20 grains
Water... ..	1 ounce.

For use, take in a wide-mouthed vial sufficient of No. 1 for the plate, mix with it (when the plate is ready) of No. 2 (say twenty drops for quarter plate), flow on and off till the plate is fully developed.

The energy of the developer can be greatly increased by adding, before the pyro is dropped in, three to twelve drops (according to size of the plate) of the following ammonia solution:—

Water	1 ounce
Ammonia concentrated... ..	1 "
Bromide of ammonium... ..	20 grains.

The advantages of this developer are:—

1. It confers, as already stated, the requisite intensity upon rapid dry plates.
2. While possessing all those good qualities which especially belong to alkaline development, it seems also to possess the additional advantages of the iron developer; for instance, the continuous strengthening of image which distinguishes iron from alkaline pyro development.
3. It admits of a shortened exposure, and is readily adapted to a longer.
4. It is economical, as well as requiring little labour in its preparation.

This developer I regard as a real boon, and worthy of its originator, who, though not a professional photographer, is a gentleman whose scientific research and freedom from those business cares which wealth confers have given him such opportunities of large and varied experiments in photography that any new results published by him are justly regarded as valuable.

Too WHITE.—The story of the negro girl's exultation at being assured by Story, the sculptor (in Italy), that in the marble bust he was to take of her she would really look *white*, reminds me of a case with a quite different result. A finely dressed coloured woman once came into my studio to sit for her photograph. She was dark, and her features of the true type, but her whole appearance rather interesting withal; so I took pains to produce a negative which would yield a face as light as possible, and the resulting photograph was almost as good as that of a white person. I anticipated no little delight when she would see the proof; but think of my surprise when she stared "a long stare" at it, and then exclaimed: "Oh, I don't like that! I ain't as pale as that!" Persuasion was out of place there; she wouldn't have it.—*St. Louis Practical Photographer.*

* Sal-soda is an old-fashioned term much used in America to indicate ordinary carbonate of soda, or washing soda, as it is at times called.

The Photographic News.

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PROTECTION OF GLASS STUDIOS FROM THE WEATHER.

At the last meeting of the Vienna Photographic Society an interesting discussion took place on the subject of protecting glass studios from the ravages of storm and wind. In this country, fortunately, we are not frequently troubled with the storms or tornadoes that are at times felt upon the Continent. At the same time our readers will, no doubt, be glad to hear of the many suggestions which our Austrian brethren have made with a view of relieving photographers from the loss which they occasionally suffer from the causes above mentioned.

M. O. Kramer, a well-known Vienna dealer, suggested the formation of an insurance company against the ravages done by hail, which, it seems, is what our friends hold most in dread. There was, according to M. Kramer, a plate glass insurance company, but the premiums charged were something like ten to twenty per cent., and would, therefore, form a considerable charge upon the income of a photographer. In M. Kramer's opinion the employment of hardened glass would meet the case, which, he said, could now be obtained at a price not more than twenty-five per cent. above that charged for ordinary glass. M. Fritz Luckhardt remarked upon the employment of wire screens by some photographers, a proceeding which robbed them of a good deal of light. So far as hard glass was concerned, he considered it more suited for printing frames than any other purpose, and stated that the firm of Lotze, in Pilsen, which occupied itself with the preparation of such material, declined to undertake an order unless it amounted to fifty plates, the glass being sold for fifty kreuzers (about tenpence) for a sheet measuring twenty-one by twenty-seven centimetres. Baron Schwaz-Seuborn remarked that in France, and particularly in Paris, where hail storms were very prolific, straw coverings were in use for the glass roofs; he believed also that the employment of hardened glass would diminish the risk of damage, for M. De la Bastie, the inventor of the process, was an amateur gardener, and had been led to make his experiments with glass by the losses he had experienced from the weather. The glass was now rendered hard, not by immersing it, when in a state of fusion almost, in a mixture of paraffin and wax, as was formerly the case, but by transferring to a bath containing certain salts in solution. A factory of hardened glass had been established between Vienna and Dornbach under the superintendence of M. Chapelle. M. Jaffé was

of opinion that it was not the hail so much as pressure from snow which wrought such destruction in winter time, and suggested a stouter framework for studios; but the objection was made to this that the light would be thereby diminished. In the end the President was inclined to favour the use of hardened glass, and called attention to the manner of producing it by Siemens, of Dresden, who pressed the glass plates between heated cakes of clay.

TWO NEW LENSES.

At the last meeting of the French Photographic Society two lenses were brought forward, the one termed the Eury-scope being the production of MM. Voigtlander and Sons, of Vienna, and the other the work of M. Prazmowski.

In regard to the former, M. Carotte offered the following remarks.

The construction of this lens is based upon calculations made by Dr. Sommer, Professor of Mathematics and Director of the Brunswick Polytechnic School. It is composed of two achromatic and symmetrical lenses, in the centre of which the diaphragm is placed; the instrument is perfectly aplanatic, working with an open aperture.

Nevertheless, a certain degree of curvature being inevitable, if absolute sharpness is required to the edges they may be secured by the employment of a diaphragm of greater or less dimensions. The lens is especially suited for views, as it gives perspective with entire truth; it also permits the securing of reproductions, monuments, interiors, and groups, both in the studio and out of doors.

The instrument gives straight lines without deformity; its chemical focus coincides with its visual focus, and there is an absence of flare. What especially distinguishes the lens, however, is its luminous capacity. Another important advantage is that it embraces an angle of sixty-five to eighty degrees, according to the nature of the diaphragm employed.

In regard to the Prazmowski lens, the constructor of it gave the following particulars. The lens I have the honour to submit to the Society gives results similar to those indicated by M. Carotte, and I have brought it forward to-day, so that there may be no pretence that it is any imitation. It is based on the principle of former lenses used exclusively for inanimate objects. By making a suitable choice of flint and crown glass, the lenses which compose my instrument have rays with a curve much more extensive than those of my panoramic lenses. The feeble curves permit the instrument-maker to give his lenses diameters relatively large, and so let them admit enough light to take groups and even portraits.

The distance between the lenses forming this instrument is much larger than in my panoramic lenses, a circumstance which renders the field more limited.

The principles which guide me in the construction of lenses—principles which permit, according to the nature of the material employed, to give either the wide-angle necessary for panoramas, or the limited angle for groups and portraits—are as follows:—

There enter into the composition of the photographic lens two vitreous substances of unequal optical power. The less difference there is between these powers the more the lenses take the form of a globe; and at the same time, to have a perfect flat field, the lenses must be approached to one another. The rectitude of the lines is assured by perfect symmetry. As the difference of the indices of refraction and dispersion augments, the globe becomes flattened, the curves diminish, but the distance between the globes augments. Given two substances whose optical nature has been well studied, a more or less simple calculation will determine all the elements of the lens—the curvature of the rays, the thickness, the most suitable dimensions of the lenses, and their distance one from another. The quantities are all

perfectly determined, and there is only one solution to the problem possible.

It is by uniting together in pairs the different kinds of glass that I have been able to construct the different lenses which I have had the honour to submit to the Society. The one I have with me to-day is but barely finished, and I exhibit it only in order to put in a claim as its originator.

THE INTENSIFICATION OF CARBON PRINTS.

In the *Photographische Correspondenz* appears an exhaustive article on the subject of intensifying pigment images for the production of negatives and other purposes. It is from the pen of Herr Karl von Stefanowski, and from it we have taken the following as being of particular interest to our readers.

Permanganate Intensifying.—As I have already mentioned, permanganate of potash is now universally employed for intensifying carbon prints. This compound renders them of an olive green, and therefore makes the images peculiarly suitable for photo-lithographic work.

If the permanganate-treated carbon print is covered with pyrogallie acid, it rapidly becomes of a sepia-brown, and acquires more vigour.

Gallic acid and tannic acid colour the pigment picture almost of a pure black; the depth of the tone depends upon the amount of these re-agents in the solutions.

Treatment with pyrogallie, gallic, and tannic acid renders the images suitable for diapositive. Sulphide of potassium and ammonium decolorize the above intensifications, and may, therefore, if need be, be employed for clearing up pigment pictures that have been treated.

A remarkable behaviour is apparent in the pigment image by the combination of the brown oxide of manganese and extract of logwood. If a permanganate image is brought into a solution of logwood, the colour varies of all shades between blue and rose-violet according to the strength of the solutions, and their temperature, and the time of the sojourn of the image in the bath. A lengthened immersion in the logwood solution darkens the image altogether, and robs it of its high-lights. This method of proceeding, however, notwithstanding that it is an energetic one, cannot be recommended either for negatives or diapositives, as it requires to be thoroughly studied until the operator is in a position to secure with certainty the desired result. The film often becomes insoluble by the treatment.

Iron Intensifying.—Laurent gave a bluish-black tone to his carbon prints by treating them with an old iron developer and gallic acid solution. This plan Mouckhoven has recently improved, the latter proceeding as follows:—The pigment image is brought successively into three solutions, and washed between every stage. The first solution consists of forty grammes of sulphate of iron in one litre of water; the second of twenty grammes of pure carbonate of soda in one litre of water; and the third of ten grammes of gallic acid in one litre of water. The image remains in the first solution five minutes, in the second ten minutes, and in the last until it has assumed the desired violet tone.

According to my experience any iron solution may be employed for intensifying the pigment image, the presence of oxide of iron or of salts of the oxide having but an influence upon the colour that results. If, therefore, it is desired to make use of an iron intensifier, any iron salt that may be to hand can be employed, whether the same happens to be an iron developer, sulphate of iron, or what not. Chloride of iron behaves in the same way as oxide of iron as an intensifier. The action of the iron is very rapid when a concentrated solution is made use of. If the intensified result is to be used as a diapositive, then of course a tint is chosen which seems to the operator the most agreeable.

Pyrogallie acid employed upon an iron intensified image renders the same of an intense brownish yellow (warm sepia).

Gallic acid and tannic acid upon an iron intensified image gives, according to the nature of the iron salt employed, a series of violet and deep bluish-brown tones.

Sulphide of potassium and ammonium yield a deep black colour with green reflection. This intensified film is a very opaque one.

Alkaline carbonates colour the iron image reddish-brown. This plan of intensifying must be carried out with care, and must not last too long, since the alkalies have a tendency to render the film reticulated, and to decompose the gelatine.

The iron image may in the same way be coloured by permanganate of potash. If the image is not sufficiently washed, it assumes a surface of metallic lustre, which does not injure the picture regarded as a transparency. If the picture is further treated with gallic or tannic acid or pyrogallie acid, it assumes a dark or blackish-brown tone.

A deep blue tone may be imparted to the iron picture by the action of red prussiate of potash, and a deep green tint by a mixture of yellow prussiate of potash and bichromate salts.

To diminish the action of the iron and any tendency to fog, and to impart more contrast to the negative, a clearing liquid may be made use of consisting of a weak solution of oxalic acid, and afterwards of citric acid.

Lead Intensifying.—If a carbon print is brought into a four per cent. solution of nitrate of lead, and then treated with liver of sulphur or sulphide of ammonium, it will rapidly assume a dark reddish-brown colour.

Bichromate of potash and bichromate of ammonia upon a lead intensified image produce chrome yellow in the picture, and colour it, by reason of the pigment it contains, of a greenish tint.

Alkaline carbonates colour a lead pigment image white, and the opacity of the latter may be increased by treatment with sulphite of potassium or sulphide of ammonium, whereby the picture is made to assume a brownish tint.

If the lead image is put into a solution of yellow prussiate of potash, and then immersed in chloride of iron, it is coloured by the first liquid white, and by the second dark green.

If the lead treated film is allowed to soak in a mixture of nitrate of lead or red prussiate of potash, it is afterwards put into an iron solution, the picture assumes a deep colour.

Silver Intensifying.—A carbon image soaked in gallic acid, and then dipped into a two per cent. solution, is made to assume an agreeable brownish-black tone.

Pyrogallie acid and nitrate of silver allowed to work upon the image furnish warm purple-black pictures.

Bichromate of potash or bichromate of ammonia and nitrate of silver make the image of a brick red.

Red prussiate of potash and nitrate of silver produce warm black prints.

Sulphide of potassium or ammonium and nitrate of silver furnish an intense black with purple tone.

A mixture of permanganate of potash and nitrate of silver yield warm purple-black pictures.

Chloride of iron, then nitrate of silver, and afterwards gallic acid, produce black images.

Chloride of iron, followed by nitrate of silver, and further with pyrogallie acid, gives warm purple black tones.

Pyrogallie acid followed by silver nitrate, and then liver of sulphur or sulphide of ammonium, yields an intense black image of a purple tone.

Chloride of nickel followed by silver nitrate and pyrogallie acid gives a warm purple black colour.

(To be continued.)

A METHOD OF OBTAINING SOFT PRINTS FROM HARD NEGATIVES.

BY R. E. COURTENAY.

THE negative should be varnished, and a piece of the auto-type tissue of the purple tint floated on the same in the bichromate bath; the excess of solution is displaced in the usual way for transparencies on glass, and dried; when dry, expose from ten seconds to forty, according to light and requirements; develop in the usual way with warm water. The proofs from a negative so treated, compared with one before treatment, will show the value of the process. You see, it is a carbon positive on a negative.

If the whole of the shadows are not required to be covered as above, retouching the negative can be accomplished as follows: pure gelatine and white sugar mixed with a little bichromate of potash, and the negative coated with the solution and dried in the dark, is exposed as above for a few seconds, and developed; treat the parts required to be softer than others with gallic acid by means of a sable brush, and then with sulphate of iron; many other solutions will do as well as those mentioned.

RESTORATION OF PRINT BATHS.

BY A. STOCK.*

TILL now it has been customary to treat silver baths, whether they have been employed for the dipping of plates or sensitizing of paper, in precisely the same way when defective or out of order, notwithstanding the fact that the print bath becomes contaminated with quite a different series of organic compounds and impurities. This should not be, for the latter requires, as a matter of course, special treatment, although, strange to say, no manual gives any definite information on the subject. The ordinary impurities that enter the print bath are: gelatine or size, superfluous acid, and combination of the latter with the chloride salts employed in the preparation of the paper. The precipitation of the gelatine matter, as of the organic compounds, is brought about by the following means:—

1. The silver bath is treated with alum solution of 1 : 10 strength (ordinary alum dissolved in hot distilled water) until small crystals are seen to form, when the liquid is filtered. These crystals are silver aluminate, which are dissolved again in hot distilled water, and added to the silver bath again; a portion remains dissolved, while the rest again separates. This silver-aluminate may be employed, therefore, again and again.

2. By adding and filtering off again burnt alum or hydrated clay, for, as is well known, the oxy-hydrate of aluminium possesses a considerable tendency to combine with organic substances, and precipitate the same when in solution. As the hydrated clay exerts the same action against colour, it is far preferable to permanganate of potash when any discolouring of the bath takes place.

If the print bath is acidified pretty strongly with acetic acid, and then kaolin added until the smell of acetic acid has disappeared, and the whole filtered, then the sizing material is also completely coagulated by the acetate of aluminium which has been produced.

There remain still the different acids and their salts to neutralise and decompose. To do this, carbonate or bicarbonate of soda have hitherto been recommended to be employed. Now, although both those compounds, and especially the latter, are excellent agents for neutralising the silver bath, I have never found the result to be a marked improvement in the bath.

On the other hand, we possess in caustic potash and soda two excellent means for neutralising and decomposing acids and salts present in the print bath. Both are dissolved in ten parts of distilled water. From one of the

two solutions (the first is to be purchased of any chemist) enough is added to bring about a gelatinous precipitate, the liquid being from time to time vigorously shaken. The silver bath now assumes a transparent, milky turbidity, or, if it does not, more caustic potash is added, until the turbidity does not disappear, and litmus paper betrays a neutral reaction. This gelatinous precipitate cannot be filtered off either by means of bibulous paper or cotton wool, as all the pores are very soon plugged, and only moistened linen or flannel can be used for the purpose. The linen or flannel is strained tightly upon a square wood frame, and the liquid poured into the middle; the strainer must not touch at the bottom, but remain free. Neither must it be pressed, as in that case some of the gelatinous precipitate is forced through. It is well to let the filter process go on during the night, and then there is plenty of time for the liquid to run through bright and clear. Those who are not conversant with this method of filtering or straining should be initiated into it by a chemist. After the operation the cloth may be dried, and be employed again.

In adding various substances to the print bath in order to purify it, one need not be nervous about going to work, for there is no harm in being a little out, and the print bath does not require such delicate handling as is the case with the negative bath.

Print baths treated in the manner described will be found to possess all the properties necessary to good working, and to impart to albumenized papers the finest lights and shadows. At the same time, the restoration of a print bath should not be delayed for any length of time, as sometimes happens with the negative bath, but should be treated periodically, especially so far as neutralisation with caustic potash is concerned. If the bath becomes too alkaline, it may easily be rendered neutral again, after straining, by the careful addition, drop by drop, of pure nitric acid.

In the above lines I have desired to indicate the theory involved in the proper restoration of the print bath, and thus to acquaint my friends with the why and wherefore of the reactions.

Dr. Liesegang, in connection with the subject, points out the method employed by Mr. Maxwell Lyte to purify turbid, brown print baths, a method which Dr. Liesegang has somewhat simplified. The following solution is prepared:—

Spring water	...	100 grammes
Phosphate of soda (crystallized)	5	"
Carbonate of soda (crystallized)	20	"

To every litre of brown print bath is added ten grammes of the above solution, the whole being vigorously shaken, and then filtered. The bath runs through the filter perfectly bright and clear. Afterwards, for every ten grammes of the above solution that have been employed, there is added to the print bath one gramme of nitrate of silver. The residue collected upon the filter-paper should not be thrown away, but added to other silver residues to be worked up at a fitting opportunity.

POPULAR MISTAKES OF PORTRAITISTS.

BY H. M. BEELES.*

AN opposition of a few of the many mistakes which the photographic artist is liable, and some of which is probably common to the entire fraternity, may not be out of place; therefore, while I call your attention to these, I beg you will either excuse or expose any error into which I may fall.

When a new-fledged candidate for public favour, whose business in the future is to be the painting of the human

* *Photographisches Archiv.*

* *H. Louis Practical Photographer.*

form divine by aid of sunlight, camera, and retouching pencil, first steps upon the platform and makes his *debut* with a graceful bow he must needs advertise, and that is all right, of course. But the nature of the advertisement is wrong in nine cases out of every ten. It reads something as follows:—*Announcement.* John Smith, Jun., takes pleasure in informing his friends and the public generally that he has just purchased an entire new outfit of the most approved style, and at a great cost; also, that he has learned the art of photography, and is now fully prepared to turn out first-class work every day in the week, &c., &c. N.B.—Satisfaction guaranteed or money refunded!!! Gallery over Snap and Ketchum's dry-good store, Pennygrab, Gold Co., Wn. Ter." I will not assume that John Smith, Jun., made a mistake in choosing a calling, for that only can be proven by after events. I will not assume that his manner of introduction to the public is a mistake, except in one respect, and that is found in the last sentence: "Satisfaction guaranteed or money refunded." Seizing on this proposition, the public is at once made aware that it can impose upon poor John as much as it likes, and then, under the plea of no satisfaction, demand restitution of money, and so he is out of chemicals, rent, time, and, worst of all, has impressed on the mind of the customer that he is an indifferent artist at the most, and one who has no confidence in himself, or else one who intends, under the plea of great fairness, to gull the public.

What would we think of a miller who would advertise thus? It is a common, I think universal custom, for artists to make a negative, and if the first proof is not satisfactory to make another, and again repeat the operation *ad infinitum*, and at last make half a dozen or dozen cards to compensate for all loss of time and chemicals. No other tradesman in the world would for a moment entertain an idea of doing business in this way. I do not blame the public—for this the artist is wholly responsible—but the public take advantage of it. For instance, a lady desires some photographs; she sits; when the proof comes she finds, to her horror, that blue did not take black, or that some ribbon on her hair looks awful. Why, it's so large; just as though the artist had not told her so at the time of sitting, and tried to dissuade her from wearing it. She looks so big or so small, or there is a wrinkle in her dress, or some other fault which she fastidiously conjures up to obtain another sitting, and so John has to sit her again and again, until either his patience or hers is worn out; and, perhaps, John has not got a cent for his trouble, and has overruled one to the opinion, to be publicly expressed, that he is a very poor artist. Suppose every artist should abrogate this rule, and, instead, should charge for negatives and photographs separately, and when a negative satisfactory to the operator is obtained, collect pay for work done; then, if the sitter wishes to have another dress photographed, she can have it by paying for another negative. Suppose that were the rule, there would be no occasion for a Pearl suit, and I venture it as the opinion of your humble servant, that there would not be half the negatives retaken. It is not a matter of any consequence whether the pictures are paid for or not at the time of sitting, but the negatives should be. Many artists are not arbitrary enough in regard to matter of dress, and in accessories as he should use. Often we find a picture in which the accessories are far the most prominent part of the picture, the face being wholly subordinate, and, as one would suppose, the last thing to be looked at.

Artists often confine all experiments to chemical manipulation, and none scarcely to the management of light or background, both of which are fully as great importance; but any experiment to be useful must be intelligently conducted. Very few great improvements have been the result of accident, though some have. Want of harmonious action and fraternal feeling is a great drawback on our financial success, though I am happy to say that in this there is a marked improvement.

HYPO IN THE SILVER BATH.

BY D. O. MUSKER.*

THE following formula for a nitrate bath I discovered by accident, and it happened in this way. While preparing to compound a bath, I had weighed out some silver on the scales which I had been in the habit of using to weigh hyposulphate of soda upon. Having weighed the amount of silver that I intended to use, I proceeded to empty it into the bottle containing the water. Noticing a crystal left on the pan of the scales, I picked it up, and dropped it into the bottle; it had barely left my fingers, when the thought struck me that it was hypo, and not silver. A second's time was sufficient to convert my fears into a certainty, as the crystal left a brown track from the top of the solution to the bottom. There was no retracting from what I had done, so taking up the bottle, I gave the contents a thorough shaking, and after directing a few choice epithets to myself, for being so careless, I set the solution away for future precipitation, and proceeded to make a new bath, in which, you may be sure, I did not put any hypo.

Some months after, upon getting this conglomerate around to precipitate, preparatory to sending to a refiner, and having a good deal of the curious in my make up, of course I could not proceed with the precipitation until I had tried a plate to just see what the effect would be, you know; and judge of my surprise, when upon developing, not a hopeless fog, as I had expected, but an unusually clear chemical effect, was presented. I went directly and picked out a piece of soda, as near the size of the piece that I had accidentally used as I could remember, and made a memorandum of the weight. This was the best and longest working bath that I had used for a long time. Still I had no confidence in hyposulphate of soda as a good thing to put into a negative bath, and did not try it again for a year or more; but when I did, it was with the same results. Again I dropped it, and again I have just made another hypo-nitrate bath, and find it the same as before. I have never had a bath in this way that has not worked directly and unusually clear.

The formula is—

Nitrate of silver ..	...	...	5 ounces
Hypsulphate of soda ..	...	...	5 grains
Water ..	...	...	60 ounces.

Dimolve the silver and water together; iodine, and try without adding acid. If acid is needed, add one drop, chemically pure, at a time. More soda might be better; some one try.

PHOTOGRAVURE.

BY M. DESPAQUIS †

THE process I am about to describe is one which I have employed for the past five years for making seals, stamps (either wet or dry), and similar impressions, for letter-paper or bill-headings, and the like, a photographic cliché with half tones being a first step in the method.

I make a positive upon glass with a collodion prepared with a pulverulent pyroxyline, and containing a small quantity of castor-oil to give the film the suppleness and toughness which it requires; or I take a positive secured by the albumen process, an image formed by gelatine, I find, tearing when it comes to be worked upon with the graver. I choose a positive with well marked blacks and whites, and not one of a clear grey or of a nearly uniform tint.

With a steel point or graving instrument I draw in the blacks of the image, and in the deeper half-tones some fine lines with definite spaces between, in the same way as a wood engraver proceeds. The point of the instrument renders the glass perfectly bare, for it removes the collodion whenever a line is drawn.

With a pen or very fine brush, and some Indian-ink, or

* St. Louis Practical Photographer.
† Monteur de la Photographie.

any other anti-photogenic colour, I next proceed to put in lines or a very fine stipple upon the whites of the image, and the more delicate half-tones, proceeding, indeed, in the reverse manner to what I did before.

This work can be undertaken by a skilled hand at very little expense, and I am charged very little for it, so that the proceeding is by no means costly. To work more freely I obtain a positive, whole-plate size, and after this has been worked up to my satisfaction, I then secure from it a small negative of the size I desire for the seal, stamp, or what not. From this little negative I produce a positive upon metal (cast steel if it is for a stamp) by the aid of bitumen. By the bitumen process the very delicate half-tones are not retained when the printing has been completed, and you proceed to development by means of the essence with which the unsolarized parts are washed away. There remain, indeed, but the lines or stipple which have been worked up by hand with the pen or brush.

The bitumen image, being thus developed upon the metal, is well washed, and then the etching may be proceeded with. This takes place in the ordinary way with acid, the bare metal portions being attacked, while the others, covered with bitumen, are protected from the action of the mordant. M. Despaquis points out that the process can also be employed with effect in chromo-

RECOVERING OF THE GOLD FROM THE GOLD BATH.

BY DR. SCHLEISER.*

DURING my long experience it happened very often that paper was given to me full of brown powder supposed to contain gold. In most cases there was only a very little gold in it, which would not cover the expense of refining it. I will give some practical hints how photographers can gain the gold residuum in the most profitable manner, and mention at first that the gold precipitated in fine brown powder may be known at once by its lustre when rubbed with steel. When the residuum contains a quantity of gold, it will show this mark of gold lustre; in the other case but a trace of it.

In old gold baths the gold will part itself after long standing completely in metallic shape, and this so much the quicker when at first a metallic precipitate is formed. If we have to do with gold baths which we suppose contain some gold yet, the bath must be weakly acidified with muriatic acid, so that the bath will colour faintly red a piece of blue litmus-paper; and then it is to be mixed while stirring it up with a diluted solution of vitriol of iron, 1:2.

The iron solution reduces the gold and precipitates it metallically as fine red-brown powder. After the precipitate has settled, it is to be washed out in acidified water till all iron is removed.

The precipitates which form in the gold baths before mixing it with iron, by standing for some time, are to be dissolved in one part nitric acid and three parts muriatic acid, and after evaporating the surplus of acid, dissolved in a little water, and treated with the iron solution, as explained above. The gold powder received in this manner can be easily sold.

Correspondence.

PUBLIC CRITICISMS OF PHOTOGRAPHIC MANUFACTURES.

SIR,—I have found more than one person disposed to "chaff" on reading the letter of Commander Turton in your last. I for one am disposed to agree with him, and

* *Photographic Times.*

to complain that there is too much reticence at photographic societies and in the journals in speaking of the quality of photographic articles offered for sale. I must confess, however, that I approach the subject from a somewhat different stand-point to Commander Turton. I am a manufacturer of various photographic commodities, and I feel certain that if the photographic societies and journals would only give me *carte blanche*—or, in rough vernacular, give me "my fling"—I could say some very interesting things on the excellence of my manufactures. Of course Captain Turton will see that what is sauce for the goose should be sauce for the gander; and if purchasers had the full right for complaint which he desires, producers should have a similar right to introduce and praise their goods, instead of being compelled to resort to the sordid practice of paying for advertisements. In the meantime, whilst the latter system prevails, would it not be fair if Captain Turton and gentlemen of his mode of thinking were content to ventilate their grievances in manner similar to that which the manufacturers must employ in making their goods known? If this were so they would be less anxious, I fancy, to publish failures which may be due as much to imperfect manipulation as bad plates.—Yours,

A MANUFACTURER.

ART IN PHOTOGRAPHY.

DEAR SIR,—Professor Green's excellent paper entitled "Can Photography Make Pictures?" which appeared in the NEWS, May 26th, and which from my own experience I can say is by no means too highly coloured, must convince your readers how meagre is the amount of artistic knowledge possessed by photographers generally, and point to the urgent necessity of some systematic course of instruction for young beginners of a much higher character than at present afforded.

Education during the last fifty years has made such rapid progress that totally illiterate persons in the lower ranks of life is now as much the exception as it used to be the rule. Therefore, there can be but little difficulty in obtaining intelligent youths having a fair share of scholastic knowledge, as pupils or apprentices, and it is in these characters only that I should be willing to admit any to share in the secrets and working of a photographic establishment.

It has been from a neglect of such a regulation as this that the profession has become inundated with assistants, whose only stock of knowledge consists of what they may have picked up while serving as errand-boys, and some little practice with a cheap apparatus of their own. I have not had much experience with assistants lately, and hope as a class they are improved; but only a short time back it was rare to find one who could be trusted to make a developer, or any other solution, or even know the names and value of the weights to be employed; neither is this to be wondered at, for what master would care to take any trouble with a boy who might leave him even without a moment's warning, and who was, generally speaking, of a very low grade as to education and manners? I therefore consider that the first step to a better system of initiation must be the institution of a legal term of servitude to be fulfilled by youths either as apprentices or pupils. In this way only can masters expect to be repaid for the trouble and expense of their training.

Some short term of probation is necessary before signing indentures, so that the masters may see a probability that the youth's habits, temper, and inclination, are such as to promise well for the future. Rudimentary works and books of instruction should be placed at the pupil's disposal, which he should be encouraged to study. A great aid to his advancement will be found in the art science classes with which almost every town is now provided, and the master will find it much to his interest to allow the pupil time and opportunity to attend them.

Practical knowledge will of course be gained by the daily

business routine of the establishment. But I must say that in all cases the proficiency of the pupil at the expiration of his term of servitude will mainly depend upon the intelligence and knowledge of the master himself. The pupil must not think that his knowledge is any more than rudimentary, and try to improve it by practice under various masters, and study, not forgetting the photographic journals. Now, the photographic societies might render the greatest service. Each should have its library, lecture-room, laboratory, and studio, superintended by professors, and, as a climax, there should be collegiate examinations and certificates. By such a system we should obtain such a class of men as would make the art of photography worthy of the respect of the world. Literature is every day offering such an abundance of new works that I fear to propose a series of progressive books of instruction, but should be much pleased to see this done by competent persons.

JAMES MARTIN.

5, Clarence Place, Ilfracombe, June 16th.

PS.—I wish to obtain old or modern French or German songs, ballads, poems, legends, or romances. Could any of your readers kindly forward me such, or otherwise assist my purpose.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third out-door meeting of the season was held at Arncliffe on Thursday, the 21st; but in consequence of the somewhat dull appearance of the morning, the attendance was not so large as usual. The party started from the Mound at 9.25, and drove by the old road past Craigmiller Castle and through Dalkeith; and as the clouds had broken up, and the sun made his appearance, everything looked favourable for a good day's work. Most of those present had been frequently at Arncliffe, and missed the familiar landmarks by the way; but the driver assured them that he knew the district perfectly, and was going the shortest road. By-and-bye, however, it was evident that the shortest road was occupying much more time than it ought to have done, and on a council being held the discovery was made that the driver had read Ormiston instead of Arncliffe, and that they were within a short distance of the former place. This mistake, somewhat discouraging at first, soon turned out to be a real advantage, as, being instructed as to a route across the country, they enjoyed a drive through scenes of varied but exquisite beauty, altogether out of the beaten track; and although Arncliffe was reached fully an hour later than was expected, no one regretted the delay. Just as the grounds were reached a sharp thunderstorm came on, accompanied by heavy rain; but under the cathedral-like covering of the celebrated beech avenue the members enjoyed their luncheon without a drop reaching them, although, thanks to Councillor Hay and the Treasurer, the luncheon was not by any means dry. The rain proved but a passing shower, and in a short time the cameras were at work in, perhaps, one of the most beautiful and photographically suitable places within not "a mile," but twenty miles, "o' Edinboro' Town."

In the course of the day the members assembled for the transaction of business, the President taking the chair on the banks of the river. After the usual preliminaries the following gentlemen were admitted ordinary members. Messrs. William and James Bertram, J. Gibson, J. Micheth, and John Heron.

The return journey was commenced at six o'clock, and the party got to Edinburgh between eight and nine, highly pleased with the excursion, although not, in consequence of want of light, very sanguine as to the results of the exposures made.

FRANCE PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held on the 1st inst., M. DAVANNE in the chair.

A letter was received from the Belgian Microscopical Society inviting an exchange of publications.

M. PERROT DE CHAUMEUX passed in review the foreign journals. He referred to the employment of carbolic acid by M. Friedlein, of Vienna, who advocates the use of this acid whenever gelatine solutions are applied, the only defect of the carbolic acid being to harden the surface of the gelatine a little on drying.

The formula M. Friedlein employs for his bichromate sensitising bath for pigmented tissue is:

Bichromate of potash	...	...	...	30 parts
Water	...	...	...	800 "
Fluid carbolic acid	1 part

Moreover, during summer is added—

Glycerine	1 to 6 parts
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To obtain fluid carbolic acid, five parts of the crystallised acid are warmed in a water-bath, and then one part of warm water is added.

M. DAVANNE read a communication from Dr. Fayal on Micro-Photography [the tenour of this has already appeared in the PHOTOGRAPHIC NEWS].

M. PERROT DE CHAUMEUX acknowledged the receipt of a pamphlet by M. Chardon, entitled: *Photography by means of dry emulsion prepared with pure bromide of silver*.

The particulars of the competition instituted for improvements in travelling equipments were read.

Also a communication from the Commission entrusted with the competition to be entered into for a substitute for glass, the prize to be delivered for a film which, while not so heavy and fragile as glass, shall lend itself as well to photographic manipulations. The prize in this case is a large silver medal, and the competition is international. Essays already made will be admitted as new inventions, and specimens must be delivered before the 1st of January, 1878. The process to which the prize is awarded must be described in the *Bulletin in extenso*, and will become public property.

M. JARON submitted a numerous collection of photographs, being reproductions from the Stockholm Gallery.

M. ANDRA stated that he was continuing his researches with M. Chardon's collodion, and, in conjunction with M. Rousselon, was attempting the reproduction of pictures by its means. M. Rousselon believed that three times the exposure was necessary. Since the commencement of the experiments M. Andra had prepared several litres of emulsion according to M. Chardon's formula.

The PRESIDENT remarked that the Commission had met a second time to make themselves acquainted with the keeping qualities of the Chardon plates, the results being very satisfactory.

M. CHARDON called attention to one or two errors that had been published regarding his process.

M. QUINAC, of Toulouse, exhibited some prints in greasy ink, which, in regard to delicacy, tint, and half-tone, were not inferior to silver pictures. They had been produced from grained copper plates coated with bichromated gelatine. As many as five hundred examples had been struck off some of the plates.

M. CAZETTE exhibited a new lens by Voigtlander called the Euryscope (see page 306). He asked that a Commission be nominated to examine it.

MM. Balaguy, Franck, Joliet, Martin, and Rousselon were nominated members of the Commission.

M. PRASNOWSKI also exhibited a new lens (see page 306).

M. FRANCK DE VILLECOULLE said it was very desirable that the lenses in question should permit of the taking of group pictures; the aplannatic lenses which he had hitherto examined left much to be desired in this respect.

M. A. MARTIN made some remarks upon the subject of so-called aplannatic lenses.

M. ANGOT read a paper on the application of photography to astronomical purposes.

The proceedings then terminated.

Talk in the Studio.

THE NEW SUMMIT.—Mr. Alderman Notlage (of the London Stereoscopic Company) was, a few days ago, elected one of the Sheriffs of the city of London for the ensuing year.

ALBERTY IN PORTRAITURE.—To make the Albertype available to portrait galleries, it only requires one establishment in each city, or large town, where prints could be made for every gallery within a circuit of several miles, and all could then guarantee imperishable pictures. Fine results can only be obtained by experienced printers, and a regular establishment can produce better work at a reasonable price than could be made by an occasional printer. Prints can be made of any size, being limited only by the size of the press. One of our New York photographers, Mr. Kurtz, has adopted the process

for life-sized heads. They are printed in pure black ink, on the best drawing paper, and then retouched with crayon, in his well known style, the paper has no chemicals in it to wash out, but is left with its original surface, made expressly for drawings. This is a step in advance of solar printing, for there has not yet been a solar print made but that would show the difference in colour of the printing and retouching after being made a short time. This can never occur with the Albertype, as both the ink with which the picture is printed and the crayon are made of the same materials. The public is beginning to see this, and will soon demand a guarantee of absolute permanence.—*St. L. and Practical Photographer.*

COLOURS OF EMULSIONS.—The colour of an emulsion, as a rule, has been supposed to be a test as to its quality and sensitiveness, and it has usually been insisted upon that a film which transmits the orange rays alone, absorbing the green, blue, and violet, is in a fair way to give a good image on development. It must not, however, be forgotten that this test is by no means theoretically certain. The colour which is transmitted through an emulsion film depends on causes which are partially, at least, independent of the light which the sensitive salt can absorb. The transmitted light is dependent to a large extent on the size of the particles formed, whereas that transmitted through a transparent body is probably dependent on the quantities of the ultimate molecules. The difference will be readily understood when we say that it is possible to form an emulsion through which only red rays can pass, and which is formed of matter which, before being divided into small particles, allows every colour of the spectrum to be transmitted. In considering, therefore, the probable effect of the colour of an emulsion, it is necessary to divide the causes of such colour into two classes.—1st. Those which are entirely dependent on the absorption by the emulsified matter itself, 2nd. Those which are due to the scattering of the particles into which such matter is divided.—*Photographic Journal.*

NICKEL-PLATING WITHOUT A BATTERY.—Dr. Kayser has succeeded in coating metals with an alloy resembling German silver, thus giving them a handsome finish, and making the surface more durable and permanent than that of tin or silver. He first melts together one part of copper and five of pure tin—preferably the Australian. The alloy is granulated, as usual, but not too fine, and then mixed with a little water and cream of tartar (as free from lime as possible) into a paste. To each two hundred parts of the granulated alloy is added one part of ignited oxide or nickel, and the articles are laid in it. After boiling a short time, they become beautifully plated. Some fresh oxide of nickel must, of course, be added from time to time. Brass and copper articles can easily be plated in this manner without previous preparation, those of iron must first be copper-plated. By adding some carbonate of nickel to the above bath, or to a common white bath, and boiling, a coating richer in nickel is obtained, and darker, varying in colour from that of platinum to a blue-black, according to the amount of nickel salt added.—*Man and Builder.*

To Correspondents.

H. W.—The Photographic Exhibition in London, to be opened in October, is held by the Photographic Society of Great Britain. Full particulars have not yet been issued, but will be published in our own pages and in the Journal of the Society. The Honorary Secretary, Mr. H. Baden Pritchard, may be addressed at the Chemical Department of the Royal Arsenal, Woolwich.

B. S.—There are many methods of treating glass so as to screen off direct sunshine, but none that we know of which will also effectually resist the damp of a leaky skylight. Perhaps the most likely to present a long resistance to moisture is varnish in which a little oxide of zinc is mixed up, which, if stippled on the glass with a stiff hog's hair tool, will produce a semi-opaque screen.

W. W.—The formula did not appear in our pages, but we remember to have seen it somewhere, but where we do not recall. So far as our memory serves us, its chief difference from the ordinary iron developer consisted in the addition of alum and camphor, for the purpose, as Mr. Wilkinson alleges, of securing in the developer a similar density to that of the nitrate bath. The necessity for this similarity has been frequently pointed out before as necessary to secure a perfectly even flowing of the iron solution over the plate covered with silver solution.

W. C. MURPHY—The address of Loebertier and Co. is 60, Regent Street.

G. H. P.—There is no work devoted solely to these subjects. For printing you will find "Hearn's Practical Printer" excellent. There is no work devoted solely to enlargement. You will find the best information on the subject in various articles in our columns and in our Year-Books.

LANDSCAPE AMATEUR, referring to Captain Turton's letter in our last, would be glad if we could devote space to the expression of opinion—either our own or that of correspondents—upon the qualities of materials sent out by different photographic houses, as it is very annoying, he thinks, to "buy various things which turn out quite differently to what buyers had been led to believe." He has, for instance, "bought many samples of dry plates, and never obtained a good negative from any of them; lenses which failed to cover sharp to the corners of the plates of the size for which they were sold; apparatus defective in many ways, and chemicals which worked badly." If he "or some one else more experienced were allowed candidly to state these facts, it would save others from being victimized." Our correspondent must see on a moment's reflection that such a course would be unreasonable in the last degree, and doing a serious injustice, to permit any tradesman to be injured on the opinion or experience of an individual. Just imagine such a course being adopted in ordinary journals in relation to the articles of general consumption. Why the law courts would be kept occupied with libel suits? Besides, the aims and duties of our journal are chiefly confined to the science and art of photography, and we avoid questions connected with its commercial aspects.

J. G. L.—The existing patent laws were passed in 1852. Previous to that date the law was much more defective than it is at present. A separate patent was required for each of the countries constituting the United Kingdom. That for England cost from £100 to £120, for Scotland £10, for Ireland £120, making a total of at least £320, all payable in advance. A patent for the United Kingdom can now be obtained on much easier terms. The provisional specification, which gives practically six months' protection, may be obtained for from six to eight guineas. On sealing the patent, and securing protection for three years, the cost is from five and twenty to thirty guineas. The three years may be extended to seven on payment of £50, and the seven years may be extended to fourteen on payment of £100 more. An amended law is now before Parliament, whether it will pass this season is quite uncertain, and if it pass it is very doubtful whether in ventors or the country will be any better off. At present the heavy fees paid for patents are the perquisites of law officers of the Crown, who appear to do little work in connection with patents.

F. L. J.—The red foggy deposit on the shadows of which you complain is aided by various causes. The best preventive we know consists in flowing the iron developed image as soon as developed with a solution of iodine made as follows:—Take two grains of iodide of potassium and one grain of iodine, and dissolve in an ounce of water. After flowing the plate with this, wash, and then proceed to intensify. The red deposit which appears during intensification in warm weather never visits the plate which has been so treated. The best mode of dealing with a negative which is spoiled by this red deposit in the shadows is to treat with a weak solution—say one grain to the ounce—of biiodide of mercury. This very slightly intensifies the image, but it converts the red deposit, which, being very non-actinic, prints white, into a thin white deposit, which does not in any appreciable degree obstruct the passage of light in printing.

R. F. L.—It is not at all improbable, as you suggest, that emulsions may eventually supersede plates prepared in a bath, but not yet. The first allusion to an emulsion was, so far as we remember, made in our pages in 1860, when Mr. Hellini made an oddly empiric mixture of various haloid salts and salts of silver in varnish. He showed us some imperfect positives alleged to have been produced by the aid of these mixtures. The next allusion was published in France, when M. Gaudin attempted to produce emulsions which he styles "Photogens." This, so far as we know, was not successful, and was not followed up. Captain Dixon subsequently patented a similar idea in this country; but nothing came of it. The first successful application of the idea of mixing the sensitive compounds in collodion, and forming an emulsion for producing negatives, was that of Messrs. Sayce and Bolton. About the same time we first made an emulsion with chloride of silver in collodion for printing purposes. We had frequently experimented years previously with emulsions of bromide and iodide of silver, and obtained pretty good negatives, but without sufficiently satisfactory results.

B. D.—It frequently happens that one thickness of flashed yellow glass is insufficient in the dark room window, owing to imperfections in the flashed surface. Try two thicknesses.

R. H. COURTENAY—Thanks. We will bear in mind your requirement.

Several Correspondents in our next.

The Photographic News, July 6, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY IN MEASURING THE FORCE OF EXPLOSIVES—
THE ELECTRIC LIGHT FOR PRINTING.

Photography in Measuring the Force of Explosives.—The war on the Danube and in the Black Sea calls to mind once more the part which photography has taken in the elaboration of submarine warfare. Most of our readers are acquainted with the earliest use of the camera in connection with torpedo defences, when employed at Venice, where a *camera-nucula* was used to record the means taken to protect the harbour. Since then photography has been largely employed in this country for ascertaining the comparative explosive power of various compounds under water, and also in impartially recording the amount of damage done by different charges. It is well known that during the past few years gunpowder has been pushed into the second place, so far as military and naval mining is concerned, and even for industrial and blasting purposes gun-cotton, dynamite, and lithofracteur are now-a-days very frequently used, especially in the Colonies and America. All these substances are alike chemically, that is to say, that the nitro-glycerine which is the active principle of dynamite and lithofracteur is a nitro-compound, and may be considered very much as a liquid gun-cotton. This latter, as every photographer knows, is made by allowing strong acids to act upon cotton, and nitro-glycerine is prepared in the same simple manner, namely, by allowing glycerine to fall drop by drop into nitric acid. In this country we favour gun-cotton for mines and torpedoes, but abroad it is the nitro-glycerine compounds which are mostly used. To discover the explosive force of these and gunpowder, picric powder, and several other inventions, photography was employed. In submarine warfare two important points have to be considered, namely, how much water a charge can displace and how far a cushion of water of a certain thickness is capable of annulling the effects of a shot. It has been found, namely, that an ironclad is not safe from the explosion of a heavy torpedo unless a cushion of air of no less than forty feet intervenes between the floating hull and the source of destruction, while a Whitehead or fish torpedo is rendered harmless by a much less interval. The depth at which a charge is exploded has, of course, also considerable influence upon its effects, so far as shock or displacement of water is concerned, and by photography it has been possible to register the various influences exerted by depth in a very striking manner. Every time an explosion of this kind occurs, water is thrown up in the form of a cone, and this cone represents the amount of water displaced. If you know the measurement of its base, and are acquainted with the height to which the water has been thrown, it remains a comparatively easy matter to calculate the cubical contents of the bulk of water thrown into the air. To register this momentary eruption of water the camera is brought into play, and with exceedingly good effect, for it is in the main due to the photographic records of these eruptions that the comparative force of the various explosives has been arrived at. A five hundred pounds charge sunk to a depth of thirty feet, which throws into the air fifteen hundred cubic yards of water, must obviously have exerted far more energy upon explosion than another of the same height and at the same depth which only displaces a cone equal to one thousand cubic yards. In this way we have arrived at the conclusion that gun-cotton is equal, if not superior, to any other explosive, while its use for such purposes is particularly convenient. As we have said, the depth of water materially influences the displacement of water. Thus a photograph of the explosion of ten pounds of gun-cotton in ten feet of water shows as a graceful cone, or rather column, of water one hundred feet in height, but

then the base is a very narrow one; while four hundred pounds of gun-cotton exploded in twenty-seven feet of water is registered by a photograph representing a column only eighty feet in height, but in this case the base of the volume of water is upwards of one hundred and thirty feet. We shall not trouble our readers with any more technical details, and have, indeed, only referred to the above to prove the real importance of photography in connection with this modern branch of warfare, and to point once more to the wonderful applications that have been made of the process in the furtherance of war science. In a stereoscopic view of the *America* hulk, which we have before us, and which was one of the earliest of the torpedo explosions registered by photography, it is possible to see actually how the hull of the vessel is momentarily poised by the energetic action of the charge, and how the mass is lifted by the destructive agent. There is nothing very wonderful, perhaps, in the depiction of such an event, for photography has since then done wonders for science; but it is a matter, nevertheless, to which we are justified in again calling attention to show how valuable is the art-science in its proper application. Chevalier, the inventor of the photographic plane-table, had a scheme whereby he hoped to make use of photographic images to enable him to direct the firing of guns as well at night as by day, so that a bombardment might be continued after dark, and the enemy thus prevented from repairing his damages. Whether, had he lived, he would have been able to have brought his scheme to a successful issue now matters little, but we have instances enough before us to show that photography has already materially assisted in war science, and bids fair to render still greater services to the soldier and sailor.

The Electric Light for Printing.—According to Dr. Vogel, photographers are again making use of the electric light, a gentleman at Prague, Mr. Winter, having lately purchased a machine for his studio, the price of which, we are told, is £150. The electric light, which formerly used only to be produced by means of a powerful Grove battery, is now more conveniently generated from a magneto-electric machine, the construction of which has recently been much improved. Indeed, at the present day, to obtain a powerful light, it is only necessary to have a powerful steam-engine, for it is now a-days simply a question of grinding out electricity. When magnets were first made use of to generate electricity, the machines were very unwieldy affairs, for a very large magnet indeed is required to give a spark by merely disconnecting the rod, or armature as it is termed, from the poles. This was the first form of permanent magneto-electric machine, and then Wheatstone conceived the idea of revolving the armature very rapidly close to the magnet, or, in other words, in the field of the magnet. In this way a far stronger electric current was evolved from the machine, but still not strong enough to give a light. Round the iron armature was twisted copper wire, and this, again, was an improvement: but it was not until Wilde took the matter in hand that any great stride was made. He employs two magnets, and the electricity evolved by one is permitted to circumvent the other magnet, which is then capable of generating a very much more powerful stream of electricity. In Gramme's machine, which is greatly used in France, the armature has no iron, but consists simply of a skein of copper wire. The Gramme, the Wilde, and also the Siemens machine are all capable of giving electric lights. After the cost of the apparatus and the steam-engine, the expense of the light is represented by that necessary for keeping the engine going. Dr. Vogel tells us that he has tested the electric light photographically, and that at nine inches distance from the carbon points (rather near, by-the-way) it is capable of producing a carbon impression in seven minutes. One can hardly get at any data from this statement, but, according to our experience of the electric light, the latter, generated by a two-horse power engine,

is but one-twenty-fourth as strong as sunlight on a summer's day at eighteen inches from the source of light. In other words, a print which would be produced in five minutes in full sunlight would require as much as two hours' electric illumination if exposed at a foot and a half distance from the points. Other questions, such as that of decentralising the rays, would have to be gone into in case such means of printing were adopted by the photographer.

PHOTO-STEREOTYPING (PHOTO-ENGRAVING).

A SUBSTITUTE FOR WOOD ENGRAVING.

BY DR. ADOLPH OTT.*

WITH regard to the *modus operandi*, it is, of course, kept secret, but the history of a plate has been stated thus by one of the above-named companies:

"The subject—a properly prepared drawing or print—goes to the photograph gallery, where a negative is made in the usual way, except that it must be more perfect than any other known to the photographic art. The negative, having been duly examined, is forwarded to the secret department, whence issues a plaster of Paris mould, which is sent to the stereotype foundry. The substance in which it is cast is ordinary stereotype metal, with some modifications, the constituents being mixed in our own works. Coming out of the 'cast,' the rough plate is shaved to the proper thickness, and sent to the printer to be tested. When passed it is taken in hand by the finishers, who are for the most part regular wood engravers, who deepen the wider spaces, and touch up any portions which may not have come out sufficiently perfect. Then clean and file proofs are taken, the former to be sent to the customer, and the latter, properly numbered, to be pasted in a scrap-book for reference, and the plate is delivered to the blooker, to be mounted type-high, when, after a final examination, it is ready for use. It may be printed from direct, or, if desired, electrotypes or duplicate stereotypes may be made from it in the usual way."

From this it seems that a plaster of Paris mould is taken from the gelatine relief, and it is evident that from the first cast a second must be taken, which is stereotyped. We prefer, therefore, to call the process photo stereotyping, and not photo-engraving. Useful information on the preparation of gelatine plates may be found in the German work of A. Martin, *Handbuch der Email-Photographie und der Phototypie oder des Lichtdrucks* (Weimar, 1872, B. F. Voigt), and *Hints on Electrotyping and Stereotyping* have been published by the celebrated firm of R. Hoe and Co., New York, who also furnish the necessary apparatus for these processes, except, of course, for the purely photographic parts.

We will here remark that, according to our own observations, the gelatine relief is better brought out by using a very dilute solution of ammonia instead of pure water, and, in order to prevent the adhesion of the plaster of Paris, the relief plates should be soaked in a solution of protosulphate of iron (40 grains to one ounce of water) to which a little glycerine has been added.

We had lately the opportunity to visit one of the above-named establishments in this city, and were really surprised at the diversity of applications and the rapidity of execution which this new process allowed. The accuracy is absolute, and, of course, every picture can be reduced or enlarged at will. Various drawings may also be combined and transferred on a plate in relief, and, where an original illustration is to be made, the draughtsman also draws an advantage from the fact that the sketching on paper allows him a much greater freedom of execution than to the xylographer, who has to work on a most resistant material, box-wood.

With regard to the rapidity of the manipulation, it is well known that the chemical effects of the sun take place very quickly, and, although many operations have to be

executed which have nothing in common with the photographic art, it can safely be stated that the production of a relief from the most complicated drawing will only require as many hours, while the same work might occupy as many days or weeks of a skilful engraver's time.

The weekly pay-roll of the Photo-Engraving Company contains over sixty names, and it is estimated that, by the aid of their system and machinery, they can execute annually an amount of work which it would require the labour of one thousand wood engravers to accomplish by hand.

By the application of artificial light—oxycalcium, magnesium, or electric light—the operator is also independent of the sun.

Is it possible to obtain also gradations from light to shade (half tones) in the same manner as in photography? Most certainly; but, owing to the fact that the relief is not in one and the same plane in such a case, a cliché or stereotype plate of this kind could not be used in the steam printing press. In the new art these gradations must be produced in *lines*; however, it is already possible, by means of the formation of a grain, as in lithography, to print half-tones directly by the steam press. The grain lays here, as on the stone, on *one* plane. We shall, therefore, soon have illustrated journals wherein nature is reproduced without the least aid of the draughtsman. What an inestimable boon for literature and science! The most important illustrated journals of the metropolis make already an extended use of photo-stereotyping, at present yet in the manner of xylography, but the hearers present will, no doubt, have observed that the illustrations of European magazines, which arrive towards the end of the week, can be found at the close already in American journals. To the dissemination of art and the artistic culture of the masses photo-stereotyping will be of the greatest benefit, in so far as works of art, which only were accessible to a small circle of connoisseurs, can, ere long, be purchased by almost everybody. Thus one improvement is initiated by another in order to render photography what it should be, a universal reproducing art!

THE INTENSIFICATION OF CARBON PRINTS.*

OF the large series of silver compounds which it would be possible to use for intensifying the carbon image by reason of the beautiful and intense tone imparted, I have referred to a few only. Those I have mentioned will, nevertheless, I have no doubt, suffice for the purposes of the carbon printer. Daylight has no influence upon the silver intensifier in this connection, and the manipulations may, therefore, be conducted at any time without fear of consequences.

The great advantage of silver solutions is, that they never fog the image, and even free defective pictures from their faults in this particular. This property of silver is easily accounted for, for the image soaks up the solution, according to its thickness; in washing, it is taken out of the lighter parts to which the fogged portions belong, so that the nitrate of silver only works thoroughly in the highest reliefs, and only deposits its colour in those places. This is a general rule in intensifying, which, however, is here peculiarly apparent. The best results will be found to be afforded by pyrogallio acid and nitrate of silver, which bring about warm purple-black pictures. To lighten up carbon pictures, after such treatment, when this is necessary, a solution of hyposulphite of soda will be found useful. Cyanide of potassium in strong solutions sometimes injures the pigment film, and, for this reason, is not to be recommended.

Intensifying with Cobalt, Uranium, and Nickel.

Chloride of cobalt and sulphide of potassium or sulphide of ammonium give an intense black with brownish tone.

* Continued from page 303.

* Concluded from page 307.

Chloride of cobalt and bichromate of potash or ammonia give a yellowish-brown film.

Yellow prussiate of potash and nitrate of uranium yield a warm sepia-brown.

Chloride of nickel and sulphide of potassium or sulphide of ammonium impart a warm black.

Chloride of nickel and red prussiate of potash colour the pigment image brown.

Divers Colouring Matters for Pigment Pictures.

Baryta water, or lime-water and alizarine, dissolved in alcohol, colour carbon prints violet.

Acetate of lead and alizarine in ammonia colour prints purple-red.

A solution of alizarine in caustic alkalies give in proportion to the amount of water that they contain a series of violet and purple tones.

Aniline red in alcohol is not suited for colouring, especially when in the enlargement process.

Sulphate of zinc and alcoholic solution of coralline, with an addition of ammonia, yield a rosy-red.

Solution of coralline diluted with water, and treated with ammonia, colours pigment prints of a carmine red.

Ordinary solution of coralline dissolved in alcohol gives red pictures.

Logwood solution colours blue.

Logwood solution and bichromate salts give a very agreeable greenish tint, which is very suitable for colouring landscape pictures.

Acetate of lead and purpurine in ammonia colour purple-red.

Purpurine dissolved in a hot solution of alum renders the prints cherry red.

Purpurine dissolved in caustic alkali imparts a carmine red to carbon images.

All the above alkaline solutions should only be employed greatly diluted with water. Clearing up liquids are not necessary, as any tint may be secured by watching the action of the re-agents, and washing off as soon as the proper tint is secured, continued rinsing having the effect of lightening the colour.

To demonstrate more clearly the different tones secured by the various re-agents I have described, a series of carbon prints showing all the various tones that are obtainable has been forwarded by me to the Photographic Society of Vienna.

To secure an even tinting throughout the image, it is necessary, before treatment, to ascertain that the degree of dryness is the same throughout the picture. To ensure this, the carbon print should either be treated with the intensifying fluids immediately after development, or the operation should be postponed until the image has become thoroughly dry. An image which is only partially dry when submitted to the action of the intensifier frequently becomes patchy by the unequal soaking-in of the re-agent that is applied.

The intensifying of the print is brought about either by one treatment, or by successive applications of the liquid to the film. The intensifying liquid is poured over in the ordinary way, and in the case of a dry image this is first moistened in water, so that the action of the liquid may be exerted all over the surface at the same instant. If several solutions are employed in the operation of intensifying, then the surface of the image should be washed with water between every application, otherwise there will be formed over the surface a fine precipitate resulting from the action of the liquids one upon the other. In this case the liquids cannot penetrate well into the film, and the result is an uneven or imperfect result.

Large pictures, or those which it is desired to handle with particular care, are best treated by being placed in a dish containing the intensifying bath. The image is put into the liquid face uppermost, so that the action of the reagents may be strictly watched. Too lengthy a treatment hardens the image too much, and if permanganate of

potash is employed, then the details of the picture suffer in course of time. As a rule, the intensifying process should last from five to ten minutes. In the event of the pigment picture not becoming dark enough, it behoves the operator simply to repeat the process until the desirable result is obtained.

The intensified pictures do not, as a rule, require treatment in the alum bath, nor is it advisable that the latter should be applied, as its action is sometimes injurious to the colour. After proper intensifying the picture is washed carefully in clean water in order to remove any superfluous liquid from the film, as also to free the latter from precipitates which may have been formed upon it.

Carbon prints which are to serve as negatives in the enlarging process should neither be waxed nor have collodion or gelatine applied to them, as every irregularity in the waxing or any imperfection in the collodion or gelatine is reproduced and rendered more prominent in the enlargement. In intensifying, with few exceptions, which I have already alluded to, the collodion and gelatine, when touched by the intensifier, not unfrequently give rise to fogging. With a good tissue neither collodion or gelatine are necessary to produce adhesion upon the glass, for when developed the image sticks very firmly indeed. In his work on carbon printing, however, Liesegang suggests the coating of glass plates previously with dilute gelatine solution dipped in alum, as a means of preventing the reticulation of the tissue, a defect with which the carbon printer is at times troubled. I am not altogether of the same mind, for a good pigmented tissue should not, and does not, yield reticulated impressions, when even the glass is perfectly free from all sorts of preparations. Reticulation has never been observed by me upon collodionized or unprepared plates, unless the tissue has been acted upon by very alkaline or acid solutions; it is well known to me, however, that such pictures as are developed upon gelatine become reticulated by reason of a number of soluble gelatine molecules being washed away during transfer, and thus impart a net-like aspect to the image. The same defect may result from air-bubbles between the tissue and the transfer basis. In this case the cause of defect must be looked for in those bodies which prevent the immediate contact of the two surfaces.

COLLECTION AND RECOVERY OF WASTES.*

In the various processes of photography in which nitrate of silver is used, the per centage of what is called waste is very large, but with proper care and management this may nearly all be recovered, and thus keep the actual consumption of silver down to a very small figure. We are convinced from the appearance of many operating-rooms that sufficient care is not exercised in saving the dripping from plates in the negative department.

In the dark-room the careful operator has in mind the saving of silver in every movement he makes. In making up and filtering his bath, he takes the precaution to spread some old newspapers on the floor to catch any drops of silver that may fall. These papers he keeps for that purpose.

With waste blotting-paper he wipes any drippings from the bottles, the bath, or the plate-holder. He drains his plates well when they come from the bath, and then uses plenty of blotting-paper to catch any further drippings in the holder. He has a box padded in the bottom with blotting-paper, in which he carries the holder from the dark-room to the camera. He saves his first washings, after developing, in a tank prepared for the purpose, and scrapes the films from all plates that are failures. This last is best done by placing the plates in a dish or tub of water till the day's work is over.

In the printing department the same precautions are observed in the use of the silver bath, as in the dark-room.

* *Philadelphia Photographer.*

Where the paper is hung to dry, waste paper of any kind is placed on the floor to receive the drippings. All cuttings from the sheets or prints are carefully preserved, together with blotters, filters, and scraps of every kind that have been stained with silver. The first washings of the prints which show a milky appearance are carefully saved in a large tank or barrel; old toning baths are also saved for the gold; and finally the fixing bath, which performs the last chemical operation for the prints, is deposited in a barrel, tub, or bottle, together with the negative hypo bath from the dark-room.

To the developer washings a small quantity of a saturated solution of salt may be added every night, and the clear water drawn off every morning from a faucet placed at a proper distance from the bottom of the tank, according to its size. The print washings are treated similarly by adding every night one pint of a saturated solution of salt to every ten or twelve gallons of water used, stir well, and draw off in the morning or when full. To the old hyposulphite baths may be added from time to time a few lumps of sulphuret of potash, or the same in solution. A black precipitate of sulphide of silver will be formed, which will settle and leave the clear water to be drawn off. An excess of sulphuret will do no harm.

When a sufficient quantity of waste has collected according to the foregoing treatment, the various kinds are then to be prepared for reduction. This may be done by freeing the residues from the surplus water as much as possible, and putting them in wide-mouth bottles, each kind distinctly labelled, preparatory to sending them, together with the waste paper, to a refiner, provided the photographer does not care to undertake the work of reducing it himself. But we would caution any photographer who sends his waste out to be careful that it goes into the hands of reliable parties. On no account deliver it to an agent of some so-called refining company who may come along and offer to do it for eight or ten per cent, for in most cases they are frauds, and if ever you receive anything, the amount will be so small that you will not feel repaid for the trouble you have been to in saving your waste. Either send it to somebody you know that will not do it for less than from fifteen to twenty per cent, according to the quantity, or else do it yourself by the processes which we propose to give you here.

The black mudlike mass which will be found in the bottom of the developing tank, after the water has been drawn off as closely as possible, should be spread upon a filter and allowed to dry. A filter for this purpose is made by stretching stout muslin over a frame or hoop of any size sufficient for the purpose. The drying is facilitated by placing it out in the sun, and occasionally turning the mass over and pulverizing it as it dries. If there be much water in this residue, it may be better to spread sheets of filtering paper over the cloth before placing the mass upon it. When it is thoroughly dry it is ready for the crucible. Collodion films are to be spread out and thoroughly dried, when they may be placed in an iron pan and burned. The remaining ashes are then ready to be prepared for the crucible.

The print washings are collected and dried in the same manner as the developer residues. Should the chloride of silver fail to settle after the salt is added and being well stirred, it may be precipitated by the addition of a mixture of slacked lime and water of about the consistency of thick whitewash; this is also assisted by the addition of a small quantity of a strong solution of sulphuret of potash.

Residues from hyposulphite fixing baths are freed from the supernatant liquid by decanting the latter; the precipitate is then washed well with warm water, and permitted to dry. This is sulphide of silver, and to prepare it for reduction it must be roasted. This is done by placing it in an iron pan or shovel, and submitting it to the heat of a brisk coal fire. This should be done in the open air, or in the draft of a large chimney. When the mass assumes a red heat and the vapor ceases, it may be removed from the fire and allowed to cool.

Print clippings, filters, and all waste paper which has absorbed silver, are to be burned. This is facilitated by sprinkling the paper, especially that which is poor in silver, with a solution of nitrate of potash (saltpetre) three ounces, water eight ounces. When dry, they are burned in an open grate or stove. Care must be taken that the draft is not too strong, or too much paper put on at once, to cause the ashes to be carried off with the flame and smoke. Do not try to hurry it, and you will be repaid for your patience. If there be a large quantity of paper an occasional raking out of the ashes from the grate will admit the air and assist combustion.

Having prepared the several residues, the next in order is to reduce them to metallic silver. This is done by fusion, assisted by various saline mixtures which are called fluxes. A different flux or different proportions are used for each of the different kinds of waste. In each case it is important that the residue and flux be ground together in an iron mortar as fine as possible, after being mixed in the following proportions:

For Chloride of Silver.—This may be precipitated from old baths or print washings.

Carbonate of potash	...	...	16 ounces
Powdered resin	...	...	2 "

Take of this flux half the weight of the chloride. Thoroughly mix and grind them together as before directed; then fill a Hessian crucible* about three-quarters full, packing it in closely. A layer of common salt sprinkled over the top tends to prevent boiling over during the fusing process. The carbonate of potash may be used alone in this case, but chloride of silver volatilizes, and portions of it escape before the reduction has commenced; the resin combining with it prevents this.

Ashes from Collodion Films.—These consist mostly of iodide and bromide of silver, and may be mixed in the proportion of five ounces of ashes to four ounces of the following flux:

Carbonate of potash	...	...	8 ounces
Bicarbonate of soda	...	...	1 ounce

Prepare the crucible the same as before.

Developer Precipitate.—This having been prepared as previously directed, mix with equal parts of the following:

Carbonate of potash	...	...	5 ounces
Nitrate of potash	...	...	1 ounce

Place in the crucible the same as before.

Paper Ashes.—These are to be sifted through a fine sieve to free them from bits of glass, nails, &c. Any beads of metallic silver remaining on the sieve should be returned to the ashes. Mix these with equal weight of

Carbonate of potash	...	...	4 ounces
Bicarbonate of soda	...	...	1 ounce

Prepare the crucible as before directed.

Roasted Sulphide of Silver.—This compound is the most difficult of all to reduce. The following flux has been proved to be excellent:

Carbonate of potash	...	...	15 ounces
Bicarbonate of soda	...	...	10 "
Nitrate of potash	...	...	6 "

Mix eight ounces of sulphide to seven ounces of flux, and only half fill the crucible, as the mixture seethes violently during reduction.

Reduction.—For this purpose a small furnace, or a stove with a good draft, should be used. An ordinary coal fire answers well, though some prefer coke or charcoal, as they produce a quick heat, and make less ashes to clog the fire. The crucible should have a cover, and be buried in the coals. As the contents of the crucible fuses and settles, more of the mixture may be added with an iron spoon, a small quantity at a time, till the crucible is filled with the molten mass. Then cover it and subject it to a white heat for about half an hour. To ascertain if the reduction be complete, take a stout iron wire and stir the mass. If reduced, it will seem

* These come in nests, and may be had of any druggist.

perfectly liquid without any feeling of sand or grittiness. The fused silver may also be felt at the bottom by its greater density and resistance, and when the wire is with drawn a smooth black glass will be found upon it, free from sand or roughness. If an examination answers these conditions the crucible may be removed and allowed to cool, and is then broken with a hammer, when a button of pure metallic silver will be found in the bottom.

These processes may seem tedious and troublesome to those not familiar with them, but they are not really so. All of the work can be done at odd times and during stormy weather, and the extra cost for materials, beyond what may be found in every gallery, is trifling.

Any photographer who will practice economy in collecting his waste, and then reduce it himself according to the methods we have described, will find a handsome balance to his credit in the waste account at the end of the year.

A USEFUL DEVELOPER.

MR. D. E. SMITH gives the following in the *St. Louis Practical Photographer* :—

"Throw equal quantities of protosulphate of iron and the double salt of iron and ammonia into a jar, and fill up with water. Shake from time to time, so that the water may be kept filled with the salt. Let this be a stock solution, easily replenished with water or salt, as occasion requires. In another jar keep a saturated solution of sulphate of magnesia (epsom salt). To make your developer measure out of the

Iron solution	...	...	2 ounces
Sulphate magnesia	...	...	2 "
Acetic acid	...	...	3 "
Water	...	...	16 "

Vary in same proportion for larger or smaller quantities. A slight modification of the acid and water may be needed to harmonize with the temperature and length of exposure. I have used no alcohol whatever in my developer for the past year, and have experienced no difficulty in flowing my plates."

COLOURING PHOTOGRAPHS.

THE process of colouring photographs is by no means so difficult a matter as you might at first have supposed. There are certainly some obstacles to be encountered, but you will soon overcome them, provided you will sit down with a determination to overcome them. You must be patient and persevering, go gradually on, endeavouring to improve with every stroke you take, keeping the tints of the face and background light, gaining colour and depth by repeatedly working over them; the effect thereby produced will be infinitely superior, and far more artistical, than if you had at once laid on the colour as strong as required. Avoid, as much as you possibly can, all washing out of tints after they have once been put on, for the surface of the photographic paper is of a delicate nature, and will not bear much rubbing. Again, you must not feel disappointed if your first efforts do not turn out altogether as satisfactory and pleasing to you as you had hoped for. Do not give up in despair, but go on, persevere, and good coloured pictures will be your reward in time. Be particular in procuring good photographs to work upon and experiment with; also, good colours and pencils to work with, for your success will in a great measure depend upon these. Do not be over anxious to get a very high finish to your work at first, which, after all, does not constitute excellence or perfection, for a good picture may be satisfactory without it, while a very bad one may have it in excess. The highest finish is labour in vain, unless at the same time there be preserved good lights and shadows, which actually make up a good, finished picture.—*Practical Photographer*.

HOW TO SIT FOR A PHOTOGRAPH.

AFTER having arranged the preliminaries as to style, price, &c., enter the operating room and inform the operator that you have but three minutes to catch the train—persuade him, if possible, to sit you in advance of two or three others who have been patiently waiting; get vexed and pout if he declines to do so without their consent. Then retire to a seat in the reception room and cultivate a view of thought best adapted to make you miserable.

When your turn comes, suddenly recollect that your hat, cloak, &c., must be removed, and that your hair needs crimping or re-arranging; wonder why you had not so employed yourself while waiting; but, no matter, console yourself with the idea that you are paying Mr. Skylight back in his own coin by making him wait.

If your face is long and slim, be sure to do your hair up high "à la pompadour;" this may make the face look a little longer and slimmer—but, no matter, follow the prevailing style, and blame the operator for all that is not as your fancy pictured it.

Should your neck be a trifle long, wear a dress cut low, or a turn-down collar. If it is the reverse, wear a high ruffle "à la Queen Elizabeth." Should "Old Glasseye" suggest a ruffle for No. 1 and collar for No. 2, think how stupid he must be not to know what folks are wearing this fall.

If the figure is tall and slim, wear a long-waisted dress with a skirt as scant as you can, but possessing a long trail; this will make you rail in appearance and rail at the artist too.

If the extremities of your mouth should be unfortunately near your ears, don't allow the artist to make a profile, because such a view would only show half of its actual capacity for buckwheat cakes, &c.

If the case is otherwise, insist on a profile, because a lady friend of yours had a side view taken which every one admires. Should there be a liberal supply of humanity in the make-up of your nasal organ, object all the more to a full view of the face.

When you are about to be sacrificed, surprise your tormentor with some new and original phrase, such as, "I would rather have a tooth extracted." When he attempts to pose you, object to the position, or, better still, bring in three or four lady friends and induce them to sustain you in your objections, get them to fuss around you as possible, and don't for a moment forget you are seated in a dentist's chair. Totally ignore the artist, so he will be responsible only in the case the picture is a failure.

If a child is to be photographed, wait till about sundown, or rise unusually early, and come before breakfast—you are aware that the best light for "the little ones" is between 10 a.m. and 2 p.m., but no matter about the light—suit your own convenience. If the child is less than two years old, insist on having it taken standing, and, to make matters still more difficult of accomplishment, put on a dark dress. If the child is older, commence a week or two before the picture is to be made to drill it in positions; teach it how to hold its mouth, and don't forget to tell it repeatedly not to be afraid of the artist, thus conveying to the child's mind the idea that something terrible will happen, and that a monster will have charge of the ceremonies.

The above is not a rare experience in the profession, but quite a common one, and the moral is obvious. If you expect a natural picture, do not get yourself up in a style entirely foreign to your everyday appearance. Discard gew-gaws and so on; dress the hair and person becomingly; and, finally, assist the artist in his by no means easy task. He must have your entire support and confidence, and the utmost good feeling must prevail throughout the operation, or the inevitable result is a failure.—*New Britain Record*.

The Photographic News.

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PHOTOGRAPHY IN THE FRENCH MUSEUMS AND GALLERIES.

ACTING upon the recommendation of a Commission, the Minister of Public Instruction and of Fine Arts in France has determined to permit the indiscriminate employment of the camera throughout the whole of his domain. Every museum and gallery under his sway may now be invaded by the photographer, provided the latter obeys the rules and regulations drawn up for his guidance and for the proper protection of the property of the public. In no other country has such open access been permitted, and there can be little doubt that the dissemination of knowledge in this way, by permitting works of art and antiquity to be reproduced, and thus brought within the province of those resident at some distance from the collections, will not fail to bring forth fruit. France leads the way fearlessly, and without hesitation; we can only hope that so good an example will be speedily followed by other European nations.

The regulations drawn up for the guidance of those desirous of using the camera in public galleries and museums will be of interest to our readers, and therefore we make no apology for translating them and reproducing them here. They are as follows:—

1. The employment of photography is authorized in the scientific and literary establishments under our control.

2. Any one desirous of obtaining permission to reproduce, or cause to be reproduced, by photography the objects preserved in any of the establishments must make a request in writing to that effect, to the head of the department. In this letter must be specified:

a. The objects of which negatives are desired to be taken.

b. The nature of the work for which the clichés are required, and its destination.

c. The name and address of the operators.

d. The contemplated duration of the operations.

e. An engagement to conform to the regulations of the department.

f. A declaration that the petitioner assumes absolutely all responsibilities which may be entailed by the reproduction.

3. Permission may be given by the head of department, or, in case of refusal, by the Ministry; the authority does not in any case create a monopoly.

4. The head of department will refuse authority in any case where the reproduction might jeopardize the preservation of the objects under his care, or in any way affect public morals.

5. The head of department will not take notice of requests for the reproduction of objects to be obtained in commerce.

6. The operators admitted into the galleries of the State must not bring with them either fire or inflammable or explosive substances. They may only make use of films prepared beforehand by a dry process. They will only be permitted to expose in the galleries; all other operations must be conducted outside.

7. The heads of departments will determine the days and hours for opening the establishments. They will also determine the order and time in which operators armed with authority are to be admitted.

8. All the operations will be conducted in the presence of an officer of the department, who will see that the objects reproduced suffer no deterioration.

9. The head of department will impose any measures which he may deem necessary for the proper preservation of the objects; he may especially prevent the same from being handled by the operators, and stipulate that the objects should be protected by a glass during the operation.

10. The Administration and the heads of departments will prescribe measures to ensure that the proofs obtained are only the reproduction of objects belonging to the State collections.

11. Any operator infringing the regulations will be excluded from the building, as well as those who compromise the safety of anything in the collections.

12. Persons permitted to reproduce by photography any objects in the State galleries or museums must comply as follows:

a. They must deposit at the Ministry of Public Instruction a good cliché of every one of the objects reproduced, the cliché in question bearing the producer's name.

b. They must forward to the department to which the object belonged two prints of every cliché.

13. The clichés deposited at the Ministry will become the property of the State, which may make use of them in any way that should appear desirable.

14. A central laboratory will be formed with the assistance of the Director of Public Works in one of the rooms appertaining to the Ministry of Public Instruction. This laboratory will serve the following purposes:

a. For the preservation of clichés deposited in accordance with law 12.

b. For the execution of photographic work, such as may be ordered to be performed by Government.

c. For the training of operators who may be deputed to act upon the public service.

d. For examining and inspecting stores of a photographic nature prior to their shipment abroad to the Colonies.

The above regulations are in the main very excellent. It will be noted that only dry processes are to be permitted, and these, we fear, will give some trouble where the museums are not well lighted. Wherever it is practicable, however, a studio will be attached to the gallery or museum, where proper exposure can be given. Although it is absolutely necessary that the objects should be jealously protected in every way, we fear that few satisfactory reproductions will be the result if the object photographed is covered with glass, as laid down in regulation No. 9.

PHOTOGRAPHING THE HUMAN VOICE.

DR. STEIN, of Frankfort, is already known to our readers as one who has done much in the application of photography to physical and physiological research. Our readers may remember the accounts previously published in these columns of Dr. Stein's successful method of securing photographic records of the pulse-beatings, and also of reproducing by photography tones such as are produced by tuning-forks and musical instruments.

Dr. Stein has now gone a step further. Our readers

have heard of the telephone, by the aid of which the voice of a speaker may be transmitted twenty miles by telegraph. With the assistance of Dr. Stein's apparatus his speech may be photographed or written down upon a sensitive plate in the shape of curves, or, rather, in the form of a serpent-like line. As the tones vary, so the waves of the line occupy more or less space, or are taller or shorter. Shrill notes or tones, where the vibrations are rapid, are represented by many steep waves; low, or bass tones, where the vibrations do not follow each other so rapidly, produce few waves in a line.

We think we can explain to our readers how Dr. Stein converts a speech into a wavy line. A membrane, very much like the head of a drum, is stretched before the mouth of the speaker so as to vibrate quickly or slowly, according as his tones are shrill, or bass. A metal band is at the back of the drum, and vibrates also; this band is in connection with an electric battery, and as it vibrates it makes and breaks contact with another metal band, to which it communicates a series of electric currents. These electric currents are communicated rapidly or slowly, according as the vibrations are rapid or slow, or, in other words, as the tones uttered are high or low. These electric currents pass to an electro-magnet, which sets in motion a little metal bar, attracting and repelling the same as rapidly as the vibrations pass. The reader must now imagine, perched upon this bar, a little screen, or diaphragm, having a little hole in its centre. Through this hole shines a light, the light making a tiny image upon a sensitive plate in a camera opposite. If the metal bar and the screen move up and down, as they will do when the vibrations commence, then the light-point makes an up and down image or stroke upon the sensitive plate. The sensitive plate is not at a standstill, however, but keeps gradually moving in a horizontal direction, and the consequence is, that the up and down stroke made by the light point partakes of the form of a curved line. This, in a few words, is the principle of Dr. Stein's mode of proceeding.

THE VISUAL PURPLE OF THE EYE.

WE have several times alluded in these columns to the so-called visual purple, or *seh-purpur*, as the German physiologist, Boll, terms it. This visual-purple is a coloured sheet at the back of the retina of the eye, and becomes impressed by light in the same way as a photographic film. The light must, however, be very intense to make an impression, and it was only by exposing a rabbit's eye in a dark room to the action of a ray of light coming through a shutter for three minutes that any image could be produced.

It has been a question how long the visual-purple remains after death. Boll found that a rabbit's eye immediately after death was in a position to receive an image quite as readily as when alive, and he asserted that he believed the visual purple to remain unbleached and photographic many hours after death. The German physiologist has been lately able to prove that in the human being such is the case for two hours and three-quarters after death, at any rate. The subject in this case was a criminal who was executed in Vienna on the 5th of March last, at a quarter past seven in the morning. The execution occurred in a badly-lighted yard, surrounded by high walls, and immediately after death the executioner, as is customary, closed the eyes of the body. Other means were then taken to keep light from the retina, and after an interval of a couple of hours an examination was made by Boll of the eye. A microscopic inspection at once showed the existence of the visual purple, so that the eye still possessed photographic properties, but no trace of an image was to be observed on the retina of the dead man. But even had a slight impression been bleached upon the purple film, say that of the prison wall, this would, nevertheless, have

disappeared again, since the membrane behind the retina possesses all the properties of a re-sensitizer, and would have restored the purple colour again in a very short time. That the visual purple does not lose its properties till some time after death may now be taken for granted.

So far as regards the possibility of an image existing on the retina after death, so as to be discoverable some hours subsequently, we may safely decide in the negative, judging from what we know of the *seh-purpur*. It is only, as we have seen in the case of the rabbit, where the object is very bright, or it is steadily reflected upon the eye for some time, that an image appears; and then the latter must be immediately fixed in alum, as otherwise the mucous sensitizer does its work, and the purple colour is restored. No doubt when the eye looks upon a very light object—the sun, for instance—and the vision remains persistent for some minutes, or seconds, afterwards, our eye has received photographic impression, but this is not likely to occur just before death. Only under such circumstances would it appear possible to secure a photograph upon the *seh-purpur*, or visual purple of the eye.

LANDSCAPE PHOTOGRAPHERS' BELT.

A CORRESPONDENT, Mr. H. Somerset Ware, sends us details of an ingenious contrivance which he has found convenient, and will, doubtless, be useful to others. It consists in a belt, with cells for holding bottles, so that each chemical is at hand for use, and in no danger of being broken, upset, or lost when out of use. The length of the belt will, of course, vary as the photographer is stout or thin. Mr. Ward's is two feet nine inches long, and five inches wide. We subjoin a diagram, with the bottles in place:—



No. 1 is collodion; 2, intensifying solution; 3, ten-grain silver solution; 4, strong iron developing solution; 5, weak iron developing solution; 6, fixing solution. The stoppers and corks must always be carefully replaced, or stopping might produce awkward consequences.

We append Mr. Ware's letter:—

"I intend the enclosed sketch to describe a plan upon which I have fitted up a belt to carry bottles, and it is an idea which may be of use to some of your readers who are fond of landscape photography, as owing to the bottles being suspended round the waist, they are more easily carried than in a box, the weight of which in itself is very considerable. It also enables you to lighten the dark tent by dispensing with some of the shelves; and it will be found a convenience to have the bottles near at hand.

"I bring this idea before you as I consider it to be a novelty, and knowing, also, that you are anxious to lay before your readers anything which may assist them to pursue photography more pleasantly.—I remain, dear sir, your obedient servant,
H. SOMERSET WARE."

FRENCH CORRESPONDENCE.

DESPAQUIS' PHOTO-ENGRAVING PROCESS—METHOD FOR OBTAINING GRAIN IN PHOTO-ENGRAVED PLATES—M. CHARDON'S WORK ON PURE BROMIDE OF SILVER EMULSIONS—THE COLLODION HE EMPLOYS—HOW HE MANUFACTURES THE PYROXILINE EMPLOYED IN HIS EMULSION.

M. DESPAQUIS is at present publishing a series of instructions connected with greasy ink printing, the details of which are not the less interesting because they have hitherto constituted a patented process, which has before been closed to the public. One portion of M. Despaquis' communication bears reference to photo-engraving, and your

readers will, I feel sure, be glad to learn something about it. M. Despaquis has observed, like all who have occupied themselves with this branch of study, that in an engraving it is necessary to have a grain inside the cavities, while the surface should be of a polished character in those portions destined to reproduce the whites of the image. He therefore set about to discover how such a result could be brought about. He applied to the metallic plate two films of gelatine, the first a thick one containing the grain, and the second thinner and absolutely free from grain. It is due to this second film that M. Despaquis is enabled to produce all the delicacy of half tone. His method of operating is as follows:—In one thousand cubic centimetres of water are dissolved two hundred grammes of gelatine; to this are added twenty grammes of liquid Indian ink and four grammes of powdered pumice, the latter being very finely ground and sifted through fine linen. Next, upon a plate of glass which has been waxed, he spreads a sheet of moistened paper, taking care to prevent the formation of air-bubbles. The solution of gelatine, previously filtered and maintained at a slightly warmed temperature sufficient to keep it liquid is then poured upon this sheet of paper. In this way a sheet is secured, covered with a thick film of gelatine having a very fine grain, uniformly spread throughout its body. When it is desired to make use of this prepared paper the second film is applied, and the sheet sensitized at the same time; to do this, it is immersed (prepared side uppermost) in a solution composed of:—

Water	500 cub. cent.
Gelatine	1 to 15 grammes
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After remaining in this liquid for some seconds the sheet is taken out, and by two of its corners (still prepared side uppermost) it is drawn over a gelatinized plate, previously prepared with ox-gall, so that later the paper may be easily detached. The sheet, dried in a locality where it is screened from daylight, is cut a little larger than the cliché, and placed underneath the latter. The exposure of the prepared sheet to the light should be about a third that necessary to give a carbon print. As in this latter process, as soon as the printing is finished, the impression is plunged into cold water, so as to transport the print, not to albumenized paper, but to a plate of polished steel or copper; it is afterwards put under pressure, and allowed to dry, and finally the image developed, as in the carbon process, with warm water. It is, indeed, treated as if it were a carbon print, rather more care being taken, however, because there is less adhesion between the gelatine and the polished steel. When the matrix-plate has been secured in this way, a mould is made, either in the hydraulic press, as in the Woodburytype process, or in a rolling mill, covering the plate with a double sheet of very stout lead. The mill must be worked two or three times, so that every detail of the image is reproduced in the lead. Finally, you produce by the aid of the electrotype process a counter-mould, which is the plate from which the printed copies are produced.

M. Willème, the inventor of photo-sculpture, who quitted Paris some years ago to establish himself at Sedan, has found out, it would seem, a very simple means of transforming the latent image which is formed in the camera into a visible picture. Thanks to the preparation of the sensitive film, which does not involve any variation of the ordinary manipulations, he renders the action of light apparent at once, so that it is possible to watch the progress of the operations until it is found convenient to arrest them. It is especially in the production of enlargements that this faculty will become useful. Some experiments are to be conducted in the studio of M. Carotte, and of these I hope to give your readers some account, together with further details of this interesting process.

Under the title of *Photography by means of pure bromide of silver emulsion*, M. Chardon has just published all the details of his process. In this work the author enters

into all the various matters, and gives the most minute instructions concerning the operations involved, and informs the reader, moreover, of the methods for producing the different products necessary in the process. Especially does he tell about the pyroxyline and bromides, and clears up much about them which before was exceedingly obscure. With M. Chardon, collodion—or, in other words, the mixture of pyroxyline, alcohol, and ether—is simply a vehicle destined to contain the various active salts, which remain so far without any reaction upon one another. In the preparation of the emulsion, if the proportion of emulsion be insufficient, then the bromide of silver formed by the addition of nitrate of silver is precipitated in part, and the result is a granular film which has no strength of cohesion. If, on the contrary, the proportion of pyroxyline in the collodion be too great, the film which is formed will be too transparent, and display a lack of sensitiveness. In this case the result will be clichés without vigour, which are incapable of being intensified. After numerous experiments M. Chardon has recognised the advantages possessed by a mixture of pyroxylines prepared one by immersion of the cotton in sulphuric acid and nitrate of potash (porous collodion), and the other by immersion in sulphuric and nitric acid with water added (resistant collodion). What distinguishes M. Chardon's work most of all is, however, the theoretical explanations, clearly and logically expressed, which he appends to the various practical results that are given.

ERNEST LACAN.

A FEW REMARKS ON PHOTO-ZINCOGRAPHY.

BY K. ELIE.*

REPRODUCTIONS of engravings and woodcuts by the aid of the camera are no longer attended with difficulty. But this is not the case when photo-zincographs are required from negatives taken direct from nature. M. Jaffé (of Vienna) and a photographer of Stockholm have both come forward at the same time with a similar method, the principle of which has, however, many drawbacks. By taking a picture through a net you obtain, it is true, large or small grain, which forms half-tone and shadows, but the direction of the points is never after the form of the pictures, and for this reason the images always appear flat; while further, the pronounced streaks and inequalities to be seen in the photograph of the net are not to be overcome. The main defect of the method consists in the circumstance that a point when etched and printed gives rise to more difficulties than a line. In etching, while a point is attacked from all sides, a line is only acted upon by acid from two sides. In printing, again, a point is not so deeply printed upon paper as a line, even when considerable care is used in the process. For this reason the softening of a sketch appears smeared, and the highest lights are abruptly isolated or cut off. In the so called English wood-cutting, in which points are allowed to stand, the printing is better, because the softening-off marks are deeper, such as are not to be obtained in etching.

For some years past half-tones have been secured in Paris in the following manner. Pigmented tissue is dusted over with asphalt so long as it remained moist, and was then printed through this dust under a negative. In this way clichés in half-tones are secured. These must, however, be printed with very little ink, should possess no open high lights, and for this reason, therefore, the pictures which resulted were never black enough in the shadows, nor pure enough in the lights. I would recommend to those who occupy themselves with similar processes to work in the manner following.

The negative, whether varnished or not, is covered with a solution of gelatine or glue; when this thin film of gelatine has dried, then a solution of asphalt is applied, to which a few drops of petroleum have been added, so

* *Photographische Correspondenz*

that in the end the asphalt coating may not be too hard. The asphalt film must not be too thick, but must still permit the whole of the details of the negative to be seen. A scraper is then taken in hand, consisting of fine sewing-needles, which on touching the negative film produces upon the asphalt parallel lines. With this scraper, or graver, the asphalt film is cut through, the lines being made to follow the principal contours of the negative. The lines thus scratched upon the negative are all over of the same strength; but when prints are taken from it, it is absolutely necessary that the lines which pass over the transparent portions of the negative should be broader than those which are drawn over the more opaque portions. I attribute this to the circumstance that by powerful illumination the open lines appear broader than when less light is used. Upon the perfectly opaque portions of the negative cross-markings may be scratched. In the sky or background of the negative the lines may be drawn by a linear-instrument.

THE PROPERTIES OF LIGHT AND COLOUR.

[THE "blue glass" subject has been pretty nearly exhausted, we think, but the following admirable summary of the properties of light and colour, from our excellent contemporary the *Scientific American*, deals with the subject in an exhaustive manner which is very interesting.]

The idea that anything can be added to light by passing it through coloured transparent substances, or by reflecting it from coloured surfaces, is utterly erroneous, and proceeds simply from ignorance of the nature of light. It has been proved by Isaac Newton, and since his time by innumerable experiments of various kinds, that pure white light, such as comes from the sun to us, contains all the colours, as well as heat and chemical activity, and that they may be separated, or the light analyzed, by simply passing it through a prism of a transparent substance. The possibility of such a separation has been understood only since the adoption of the vibratory theory, which also explains the nature of the caloric, luminous, coloured, and chemical rays. According to this theory, the vibrations, when at comparatively low velocity, manifest themselves as heat only; when the vibrations are rapid enough to produce four hundred and fifty billion waves per second they become visible as red light. Five hundred billions produce the sensation of orange, five hundred and fifty billions that of yellow, and so on through green, blue, and violet, the latter resulting from eight hundred and fifty billions of vibrations per second. Vibrations still more rapid are invisible to the human eye, but their existence is demonstrated by their chemical action, in the same way as the invisible vibrations below four hundred and fifty billions per second manifest themselves as heat only.

Densely transparent media retard the light, and this retardation will affect the rapid vibrations more than those of slower velocity; and under certain circumstances such media will cause light to be deflected from its course in such a way that the most rapid vibrations will be most deflected, and the slowest least. This is the principle of refraction, by which light can be separated into its caloric, chemical, and luminous rays of different colours. The refraction of light, permitting the examination of the colours into which it has been split up, is the fundamental principle of the spectroscope, by which the nature of various luminous and illuminated substances can be determined.

The apparent colours of objects are caused by their reflecting rays of vibrations of certain velocities, and neither reflecting nor absorbing others; and the hues of transparent coloured objects are similarly produced. They pass only certain rays, and absorb the others; and the reflected or transmitted colour is then called the colour of the object. In order to perceive such a hue, it is essential that the light by which it is illuminated contains that colour; and this is directly demonstrable by illuminating objects with

light of one colour, when objects of all other colours will appear black or grey. Such a light can, for instance, be produced by burning alcohol in which common salt has been mixed; this produces a pure yellow flame, and objects of whatever colour, when seen by daylight, if illuminated by such a flame, will only show this colour. Human faces, for instance, have in this light a ghastly, death-like appearance.

An ordinary gas, lamp, or candle light is not a pure white, being deficient in blue rays, and has an excess of red, orange, and yellow; a white object cannot, by such a light, be distinguished from a yellow one; light blue cannot be distinguished from green, and dark blue looks almost black.

In regard to the nature of coloured objects, whether painted or dyed, and of transparent media, such as coloured glass or liquid solutions, the analysis of their colours by means of the spectroscope shows that what we call simple colours are in most cases complex. Only those colours are pure and simple which we obtain by the prismatic refraction, namely, the spectroscopic colours. The blue cobalt glass, for instance, which is now called masarin glass, is proved by the spectroscope not to owe its violet shade to the very refrangible and chemically active violet rays at the extreme end of the prismatic spectrum; but, on the contrary, this part of the spectrum is totally absent from light passed through blue glass. The special shade of the masarin glass is caused by the fact that its blue is tempered by a considerable quantity of the less refrangible red rays at the other or caloric extremity of the spectrum, and even with a trace of orange. Its blue is, therefore, of less chemical activity than the prismatic blue, and of course in all its functions—such as heat, chemical action, &c.—is far below the original unchanged solar light.

We have gone into the details of these rather elementary matters for the purpose of exposing the ignorance of those who ascribe to the glass a special chemical or curative influence. Some photographers have used blue glass long ago, in order to moderate the intensity of the light for the eyes of the sitter, without robbing it of too much of its chemical activity; and those photographers who possess common sense or experience know that, far from adding to the effect of the light the blue glass is an impediment, and the necessary time of exposure is rather extended by its use than otherwise. It is strange that such errors can prevail for years, when a simple experiment can settle the matter. All that is necessary is to photograph the solar spectrum, to do the same with a surface painted with a number of various coloured pigments, and also to expose a sensitized surface under a series of coloured strips of glass. The writer of this article did this more than thirty years ago by the Daguerrean process, and satisfied himself about the following points: 1, The chemical effect of the prismatic spectrum extends, for iodide of silver, from beyond the violet to the blue; 2, When bromine is used in connection with the iodine, it extends to within the green, while the yellow and red rays appear to have no effect on silver compounds, but may possess it for other substances; 3, In photographing pigments there is the utmost diversity in the results, according to the nature of the pigment—much greater than the differences in shade would lead us to expect. As a general thing, the pure reds, orange, and yellow, such as are produced by vermilion and chromates of lead, are photographically inert, and give blacks. The blues are the most active; most of all being ultramarine, next the violet lakes. But even the red carmine takes well, as it has a violet shade; but among the blues, those bordering on green take least, and hence foliage tends to give dark effects, which are only slightly corrected by using bromine; 4, In using as negatives strips of coloured glass to print in sunlight, much depends on the shade and intensity of the colour. In general, the chemical effect follows the prismatic series from red to blue; but the most effective blue glass is always found to be far inferior to the sunlight alone, pure and simple. And this fact is sufficient to settle the question

readers will, I feel sure, be glad to learn something about it. M. Despaquis has observed, like all who have occupied themselves with this branch of study, that in an engraving it is necessary to have a grain inside the cavities, while the surface should be of a polished character in those portions destined to reproduce the whites of the image. He therefore set about to discover how such a result could be brought about. He applied to the metallic plate two films of gelatine, the first a thick one containing the grain, and the second thinner and absolutely free from grain. It is due to this second film that M. Despaquis is enabled to produce all the delicacy of half tone. His method of operating is as follows:—In one thousand cubic centimetres of water are dissolved two hundred grammes of gelatine; to this are added twenty grammes of liquid Indian ink and four grammes of powdered pumice, the latter being very finely ground and sifted through fine linen. Next, upon a plate of glass which has been waxed, he spreads a sheet of moistened paper, taking care to prevent the formation of air-bubbles. The solution of gelatine, previously filtered and maintained at a slightly warmed temperature sufficient to keep it liquid, is then poured upon this sheet of paper. In this way a sheet is secured, covered with a thick film of gelatine having a very fine grain, uniformly spread throughout its body. When it is desired to make use of this prepared paper the second film is applied, and the sheet sensitized at the same time; to do this, it is immersed (prepared side uppermost) in a solution composed of:—

Water	...	...	500 cub. cent.
Gelatine	...	...	1 to 15 grammes
Bichromate of ammonia	...	...	15 "

After remaining in this liquid for some seconds the sheet is taken out, and by two of its corners (still prepared side uppermost) it is drawn over a gelatinized plate, previously prepared with ox-gall, so that later the paper may be easily detached. The sheet, dried in a locality where it is screened from daylight, is cut a little larger than the cliché, and placed underneath the latter. The exposure of the prepared sheet to the light should be about a third that necessary to give a carbon print. As in this latter process, as soon as the printing is finished, the impression is placed into cold water, so as to transport the ink to the sensitized paper, but to a plate.

It is afterwards put ... 5 to 10 grains and finally the ... 1 ounce with weak strength of salt for line work, and I find, ... both solutions are diluted one-half, and No. 1 only allowed to change the tone of the deposit to grey, and not to bleach it, it answers well for half-tone negatives.

"The colour of the negative is changed to a deep red, and is very non-actinic. It should be flowed, while damp, with a solution of gum-arabic as a varnish."

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS

Dr. FAYET lately presented to the Academy of Sciences, Paris, the details of a new method of micro-photography. He placed upon a window sill the microscope he employs for the purpose, which had over the top a small wooden box supported on a tripod. This wooden box is the camera, which can be fitted and removed at pleasure, and has a plano-convex lens inside the camera, moved by a screw. By calculation the author had determined, first of all, and noted upon the exterior, the different heights that the camera should occupy in order to secure enlargements with the various powers employed, the image refracted by the lens being projected upon the focusing screen of the camera of the same size exactly as it is seen with the eye. Matters thus regulated, M. Fayet takes the microscopical preparation it is desired to enlarge, and reproduces and examines it under the microscope; and when the latter has been properly focussed, the camera is put in its place, without

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into all the various matters, and gives the most minute instructions concerning the operations involved, and informs the reader, moreover, of the methods for producing the different products necessary in the process. Especially does he tell about the pyroxyline and bromides, and clears up much about them which before was exceedingly obscure. With M. Chardon, collodion—or, in other words, the mixture of pyroxyline, alcohol, and ether—is simply a vehicle destined to contain the various active salts, which remain so far without any reaction upon one another. In the preparation of the emulsion, if the proportion of emulsion be insufficient, then the bromide of silver formed by the addition of nitrate of silver is precipitated in part, and the result is a granular film which has no strength of cohesion. If, on the contrary, the proportion of pyroxyline in the collodion be too great, the film which is formed will be too transparent, and display a lack of sensitive-ness. In this case the result will be clichés without vigour, which are incapable of being intensified. After numerous experiments M. Chardon has recognized the advantages possessed by a mixture of pyroxyline prepared one by immersion of the cotton in sulphuric acid and nitrate of potash (porous collodion), and the other by immersion in sulphuric and nitric acid with water added (resistant collodion). What distinguishes M. Chardon's work most of all is, however, the theoretical explanation, clearly and logically expressed, which he appends to his various practical results that are given.

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REPRODUCTIONS of engravings and woodcuts by the aid of the camera are no longer attended with difficulty. This is not the case when photo-zincographs are required from negatives taken direct from nature. At Vienna) and a photographer of ... through my ... come forward at the ... said of lightning, I often ... the view being the principle of the ... This, I think, shows ... clearly that the chemical power of lightning is quite equal to the electric light produced artificially, and nearly equal to daylight. As this is the first time I have ever heard of a photograph being taken by lightning, I thought it worth communicating to the PHOTOGRAPHIC NEWS.—Yours truly, A. J. JARMAN.

Proceedings of Societies.

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An ordinary meeting was held May 1st, President H. J. NEWTON in the chair.

The minutes of the last meeting were read, and, after some corrections by the President, approved.

The President introduced Mr. William Willis, Jan., of London, who exhibited a number of beautiful prints made by his

Platinum Printing Process.

Mr. WILLIS said: The object of this process is to produce photographic prints which shall be permanent (or unalterable) under all atmospheric conditions. This object is attained by the use of salts of platinum in such a manner that the finished image shall consist of this metal in the metallic state. Every chemist knows that metallic platinum is quite unaltered by any atmospheric influences, and is, moreover, unattacked by most chemical reagents; it therefore follows that prints produced in this metal are also permanent, and, to prove them so, they have been subjected to a great many severe oxidizing and other tests which have shown them to be impregnable. The process is founded on the following reaction. I discovered that platinum is instantly thrown down from its salts in a metallic state by a solution of ferrous oxalate in neutral oxalate of potash. Ferrous oxalate is a lemon yellow powder insoluble in water and in most other menstrua, its almost only solvent being the neutral oxalate of potash. Now it is well known that ferrous oxalate is produced by the action of light on

about the special virtues claimed for blue glass: it cannot possibly have any not already possessed by sunlight. However, if people are induced by its pretended curative properties to take sun baths, which they otherwise might neglect, they may be often benefited by the salubrious influence of the radiation of the mighty orb, an influence which cannot sufficiently be appreciated; but the blue glass would probably get the credit which exclusively belongs to glorious old Sol.

ON A NEGLECTED METHOD OF INTENSIFICATION.

BY J. CARBUTT.*

[REFERRING to a recent paper read before the Photographic Society by Captain Abney, on the "Copper Bromide Intensifier," Mr. Carbutt says:]

"This mode of intensification has been in use in this country for some years among those using negatives for photo-lithography and relief work; how long I do not know, or who is the author of it. I obtained it from a friend in 1874, since which time I have had it in constant use, but I do not think it has been used as strong as recommended by Captain Abney. Finding in my own practice that the use of a solution of nitrate of silver for blackening the whitened image was rather expensive, I sought to obtain a chemical reaction that should still be as effective without the expense, and the following extract from my notebook will explain it:

"February 19th, 1875. Important improvement in intensifying line negatives. The cupro-bromide solution given me by Mr. Walker I have modified by substituting a five to ten-grain solution Schlippe's salt for the silver solution used to blacken the film. I find a very thin negative only required. It gives the most satisfactory negatives for photo-lithography and relief-plate work I have ever obtained. It is most valuable.

"The formula is:

No. 1 Solution.			
Sulphate of copper...	...	...	400 grains
Bromide of ammonium	100 "
Water	20 ounces

No. 2 Solution.			
Schlippe's salt	5 to 10 grains
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The latter strength of salt for line work, and I find, when both solutions are diluted one-half, and No. 1 only allowed to change the tone of the deposit to grey, and not to bleach it, it answers well for half-tone negatives.

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touching either the microscope or the preparation, the eyepiece remaining in its place. He brings the lens down to the point corresponding to the scale referred to above, and, without even taking the trouble to look at the image upon the ground glass, he forthwith proceeds to put a sensitive plate into the apparatus. When the exposure is at an end, the cliché is developed in the ordinary way. The advantages claimed by Dr. Favel for this mode of operating are the following: 1. It furnishes to the physiologist the possibility of taking a photographic image of any object visible under the microscope, no matter to what scale it is enlarged; 2. It permits the production of an image without touching the microscope or the object or preparation under it—there is no need even to focus after the camera has been adjusted, because this is done automatically, and always remains the same; 3. It yields an image of the dimensions precisely of that seen through the eyepiece; and, finally, it allows one to transfer to a competent operator all the photographic labours connected with the affair. The microphotographs presented to the Academy of Sciences as the fruits of this apparatus were of a most interesting and remarkable character.—*Scientific American*.

Correspondence.

PHOTOGRAPHING BY LIGHTNING.

DEAR SIR,—On June 10th a severe thunderstorm visited Ramsgate; the lightning being very vivid I tried to obtain a photograph, and succeeded perfectly after sensitizing a quarter-plate in the ordinary way. I placed it at the back of a negative. Four flashes were counted, and upon developing up came the image as clear and as quick as if taken by ordinary daylight. One flash with a weak negative gave a fair transparency. I next tried with the camera; after getting everything nicely in focus through my studio window, which was done by the aid of lightning, I obtained a photograph with twenty flashes, the view being the back of Queen Street, Ramsgate. This, I think, shows most clearly that the chemical power of lightning is quite equal to the electric light produced artificially, and nearly equal to daylight. As this is the first time I have ever heard of a photograph being taken by lightning, I thought it worth communicating to the PHOTOGRAPHIC NEWS.—Yours truly,

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ferric oxalate; if, then, a piece of paper be coated with this latter salt and exposed to light under a negative, we get a faint picture in which the parts affected by light consist of ferrous oxalate. In my process the paper is coated with a salt of platinum in addition to ferric oxalate. If paper so coated be exposed to light under a negative, we shall have, as before described, a picture in which the parts acted on have been changed from ferric to ferrous oxalate; but in this case the picture in ferrous oxalate is in contact with the salt of platinum, with which the paper is also coated. In this state no reduction takes place in the platinum salt, because the ferrous oxalate in contact with it is not in solution. The moment, however, this faint picture is floated on a warm solution of the neutral oxalate of potash the ferrous oxalate is dissolved, and in the instant of solution reduces the salt of platinum in contact with it, and so forms the picture. This is merely an outline of the general principle on which the process is founded; but to make a practical use of it requires experience and familiarity with the different manipulations. In conclusion, I may mention that the exposure to light required by this process has been variously estimated at from one-fourth to one-sixth of that required in the ordinary silver printing process.

The PRESIDENT inquired if a picture that was over-exposed could be remedied when developing.

Mr. WILLIS replied that it could not, as it is then fixed, and cannot be altered. But he had not yet found any trouble from that cause, as very little practice would enable a person to judge of the correct time for exposure.

Prof. C. A. SEKLEY remarked that this process of Mr. Willis was certainly deserving the attention of photographers.

The PRESIDENT said that the specimens exhibited were very beautiful, and from the description of the process the natural inference would be that they were permanent. He hoped that this process would be fairly tried by the photographic fraternity.

Emulsion Portrait Negatives.

The PRESIDENT said that some time since he stated that from certain indications he was satisfied that emulsion could be made practical for portraiture in the gallery. Hence he had been experimenting in that direction for the last twelve months, and had so far succeeded that he felt justified in stating that he could make better negatives with less exposure and with greater certainty of results than could be made by the ordinary bath process. For gallery work he used the emulsion wet, simply washing the coated plates with water until the greasy lines disappeared. An ordinary glass bath-holder filled with water was very convenient for this purpose, for in this the plates might remain any length of time, suiting the convenience of the operator, without fear of injuring the working qualities of the emulsion.

The PRESIDENT then exhibited a number of portraits made with emulsion with an exposure of only one-third the time of his ordinary bath process. These pictures seemed to call forth not only surprise, but universal commendation. They were, in fact, pronounced the best emulsion work ever exhibited before the Section, and quite equal to the capabilities of any process whatever.

After the examination of the pictures by the members, the PRESIDENT stated that he had not yet published the formula by which these were made, but expected to at some future time. For the present he preferred to have the making of the emulsion under his own supervision and control, not because he desired to make money by withholding it, but to protect himself from adverse criticism; for he had noticed that a published formula was rarely followed strictly by those who attempted to use it, and the failures thus resulting were unjustly attributed to the process. M. Laudi, of Columbia College, says in a letter to me a few days ago—"Your wet emulsion plates I find develop readily with an exposure of one-half the time of bath plates, and with far better results. I do not, therefore, hesitate to state that your emulsion process is entirely practical, and it must and soon will be adopted by all who will give it a trial."

Prof. CHARLES A. SEKLEY said that he remembered this emulsion process some seventeen years ago, just as he was stepping out of photography. The emulsion then had an excess of silver, so it would not keep long. It was slow, and the collodion would deteriorate, though he remembered some very fair pictures were made with it. But the process was uncertain. The present method of the President he considered a perfect success. Looking at it from the standpoint of seventeen years ago he would say it was perfection, and, as far as his judgment went, he would be much surprised if it did not come into general use.

Mr. D. C. CHAPMAN exhibited two negatives, and said he supposed they were all aware that his work was principally for astronomical purposes, and hence it requires chemicals as sensi-

tive as possible; and in order to get the maximum amount of sensitiveness from wet iodide of silver plates, he gave them a pre-exposure to light, which increases their sensitiveness about three-fold. In making some experiments with emulsions, both dry and wet, he tried the pre-exposure, to see if the same increase of sensitiveness could be obtained by that method, or, in other words, to see if a pre-exposure would affect the bromide of silver in the same manner as it does the iodide. He had brought with him two negatives which he had taken, one with the dry emulsion, and the other with the wet. One-half of each negative was exposed to light previous to being exposed in the camera, and he failed to detect any difference in the sensitiveness of the sides when being developed, as the negatives which he exhibited would show. He was therefore under the impression that the sensitiveness that can be obtained from an emulsion plate must be derived from the chemicals rather than by any pre-exposure.

Mr. T. C. ROOZE said that any good emulsion could be made to work more rapidly by first washing the coated plate thoroughly with water, and then flowing over it a solution of alkaline albuminate of silver before exposure. This solution is made by using the white of one egg, two ounces of water, and a few drops of aqua ammonia. To this is added enough of a thirty-grain solution of nitrate of silver to make the mixture milky. Now add ammonia again until the solution becomes clear. A few drops will be found quite sufficient to accomplish this. Before development the plate should be well washed, and a ten-grain solution of bromide of potassium flowed over; then wash and flow on the pyro. The picture will show up quickly. Now add a few drops of ammonia and bromide of potassium solution to the pyro, and complete the development.

Talk in the Studio.

HELIOTYPE PRINTING.—From a circular issued by Messrs. B. J. Edwards and Co. we learn that a rumour to the effect that they were giving up business as photo-mechanical printers is without foundation. Mr. B. J. Edwards leaves the firm, which will be carried on in future as H. M. Wright and Co.

DISPUTED LIKENESS IN A PORTRAIT.—"Miss Helen Barry," *The Theatre* remarks, "is not a lady to be trifled with. Mr. Gilbert Dickenson, of Bond Street, had received a commission to paint for thirty guineas a portrait of her in the character of Princess Aouda in 'Round the World in Eighty Days.' He executed the order, but when the portrait was delivered the lady refused to take it in, on the ground that it was not at all like her. Mr. Dickenson said that the lady had failed to keep several appointments for a sitting, and that the picture had had to be finished by the aid of photographs alone. 'True,' said Miss Barry, 'but I was unable through illness to come; and this you knew.' Mr. Dickenson brought an action against Miss Barry in the Bloomsbury County Court for the sum referred to, and the judge, without calling upon her counsel, gave a verdict for the defendant; a decision from which there is to be an appeal. Mr. Montague Williams, who appeared on her behalf, seems as quick as ever to seize a point. 'Is the lady in court?' asked Mr. Dickenson's counsel. 'She is,' replied Mr. Williams; 'but as you suppose that that painting resembles her, I am not surprised at your failing to recognise her.'"

HOAXING A PHOTOGRAPHER.—The race of practical jokers is not extinct. There are still men whose love of fun appears to be stronger even than their love of money. They have their joke, and they do not grumble over-much to pay for it. It may be that they occasionally pay too dear for their whistle; but what is money, after all, compared to the gratification of the passion animating your practical joker? Such men risk friendship as well as money; and it has happened in the case under notice that the joker has lost his friend as well as his cash. It would be impudent to mention names in this affair—vulgar curiosity must find them out for itself. I may help the curious, however, by stating that the records of the County Court would furnish all the information they desire on this subject. It appears, then, that a few weeks back a certain well-known veterinary surgeon sent a pressing message to an equally popular photographic artist with regard to a horse then lying in *extremis* at Kingwinford. The horse was dying, and the desponding owner desired to have his picture taken before it was too late. Besides, it was possible that the likeness would be required in a County Court action, inasmuch as the

animal was dying from injuries received in a collision. The photographic artist obeyed this order with his usual alacrity. Cruel to relate, however, he found, on arriving at Kingswinford, that there had been no accident, that no horse was dying there, and that the owner contemplated no action in the County Court. That action was reserved for the disappointed artist himself. Though one of the best tempered men in the world he did not see the justice or the fun of sending him and his artistic paraphernalia on a bootless errand of this kind; and so, while his friend the "vet." was rampant with delight, the artist quietly put him in the County Court for three guineas! The money has since been paid, without the formality of a trial before Judge Kettle, and the event is being commemorated by the issue of a picture, not of a dead horse, but of three sovereigns and three shillings artistically arranged as "an allegory."—*Dudley Herald*.

PAINT BURNISHING.—Rub over your prints and mounts, before burnishing them, the following solution. It keeps out moisture from the prints, and preserves them, and gives a brilliant finish far superior to any soap or soap solution, which absorbs moisture, and soon injures the picture. Take white wax one hundred and twenty grains, ether two ounces, alcohol sixteen ounces. Cut or scrape the wax fine, and add it to the ether; shake, and it will soon dissolve; then add the alcohol, and shake well again to mix.

To Correspondents.

PETER SNAWCROSS.—The simplest mode of dealing with used developing and intensifying solutions is to add them to used hypo solution.

NEMO.—The size of a skylight for printing under must depend entirely upon your facilities as to space, &c. We should think about thirty feet long and six feet wide would answer, the skylight being of the lean-to form. If the tables on which the printing-frames are placed are made with large, easy-running castors, they can be readily pushed into the open, or withdrawn under the skylight, as may be required.

CONSTANT READER. must be aware that we have given many hints on the subject of blisters in prints. Many plans have been proposed, but none have proved universally successful, especially when very highly albumenized paper is used. The addition of alcohol to the hypo bath has been found often successful. Placing the prints in salt and water instead of plain water when they leave the fixing bath has been found useful by some. When they occur, change the first washing water, and then the second. There is a tendency in the blisters to turn black.

J. J. WALKER.—The risk of the printing breaking up is reduced by making it as thin as possible. The object of the mixture of nitric acid and spirit is to coagulate the albumen in the film, as well as to remove the bichromate, and the stronger the spirit, the better it will perform its work. The resin which is added to methylated spirit to constitute it "finest" is usually shellac.

THOMAS WHITE.—We should be disposed to refer the defect to some impurity in the washing water. You are fortunate, however, in having the remedy you mention. Avoid, in future, working in the room where the defects occur.

W. W.—We do not remember the address. We very rarely use alcohol in the developer at all, and we think it much better to avoid it. If added, it is better done at the time of use. Acetic ether is at times formed in a developer containing acetic acid and alcohol. But the special defect you mention is not likely to arise, as ether will not act on the wet film.

G. WALTER.—The difficulty arises from the slight solubility of the potassium salts in highly rectified alcohol. The best remedy is to grind the salts in a mortar with a few drops of water, and then add alcohol, and grind again until the whole is dissolved. When adding to the collodion, add a little at a time, and shake well between.

YOUNG PRINTER.—It is always wise to have a stock of toning solution ready for use; but it is not difficult to prepare a solution which may be used in a few minutes. When this is necessary, take of your stock solution of chloride of gold as much as contains one grain. Make this into the condition of thick cream by rubbing up with it prepared chalk. Now pour upon it six ounces of hot water, and stir well. As soon as the solution is cool, it may be used, and will be found to tone satisfactorily. It is always wise to make the tub of gold containing fifteen grains into solution with fifteen drachms of alcohol, each drachm then containing one grain of chloride of gold. It is less liable to reduction in alcohol than in water.

A. F. SMITH.—Thanks for charming prints and fine cloud negatives. We shall have something to say on the subject in our next.

B. F.—The pyroxyline is bad. It is very insoluble man fatty from your account of it, and three grains to the ounce of solvents gives a glutinous collodion. Pyroxyline to yield good collodion should, as a rule, dissolve freely at the rate of four or five grains per ounce in equal portions of ether and alcohol, and this should give a lumped collodion flowing freely, and giving a good film. We believe Mr. Atkinson, of Liverpool, keeps Anthony's cotton.

H. M. K.—The prints have not arrived.

W. COLQUHOUN.—We cannot explain the delay. It probably arises from the firm in question having more limited facilities for carbon printing than the other class of work. We regret that we do not see any way in which we can help you. There is no doubt about the respectability of the firm, although the case you describe seems to indicate imperfect business arrangements.

R. & J. W. B.—It has been held of late, in relation to literary copyright, that registration is only necessary preliminary to commencing an action for infringement. Our understanding of the Fine Art Copyright Act is, however, that registration is necessary before suing prints.

H. N. WHITE.—We regret to hear of the negligence in relation to your letters, which should have been answered by the gentleman to whom they were addressed.

J. H. WHITBROOK.—Many thanks. We shall have pleasure in publishing your remarks in our next.

W. W. WINTAN.—The matter shall have our consideration. Several Correspondents in our next.

METHEOROLOGICAL REPORT FOR MAY.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Braystones, near Whitehaven, 36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Eight.	Morning.	Noon.	Night.	
1 30.18 30.30 30.20	40°	50°	37°	Fair, generally sunny			
2 30.17 30.05 30.01	35	43	39	Fair, but gloomy			
3 29.99 29.97 29.94	40	47	40	Fair and sunny			
4 29.90 29.91 29.89	39	46	40	Fair, generally sunny			
5 29.80 29.74 29.72	41	41	34	Fair, but gloomy			
6 29.58 29.64 29.61	47	50	46	Fair, but gloomy			
7 29.68 29.63 29.60	44	47	39	Fair, generally gloomy			
8 29.59 29.54 29.50	43	57	49	Fair, but gloomy			
9 29.48 29.42 29.42	42	50	48	Rain p.m.			
10 29.24 29.30 29.40	46	50	49	Rain			
11 43.29 47.48 48.40	57	60	50	Rain			
12 45.31 45.15 45.29	57	62	47	Fair and sunny			
13 45.40 45.32 45.62	43	52	49	Rain a.m. Gloomy			
14 45.07 45.09 45.64	46	50	50	Showers a.m. and p.m.			
15 45.47 45.47 45.56	52	51	50	Rain a.m. and p.m.			
16 45.31 45.58 45.53	53	56	51	Rain a.m. and at night			
17 45.42 45.50 45.56	60	50	49	Showers a.m. and p.m. Windy			
18 45.87 45.93 45.12	53	—	47	Fair, generally sunny.			
19 45.12 45.10	—	54	57.5	Fair, generally sunny. Windy			
20 45.10 45.13 45.20	54	59	41.5	Fair and sunny			
21 45.11 45.00 45.97	46	56	43	Fair, generally cloudy			
22 45.8. 45.95 45.95	40	54.5	49	Fair and sunny			
23 45.91 45.91 45.90	55	—	45	Fair and sunny			
24 45.06 45.81 45.77	52	—	54	Fair, generally cloudy			
25 45.20 45.27 45.07	50	53	52	Rain all day			
26 45.78	—	52	52	Showers of rain a.m. and p.m. Windy			
27 45.10 45.17 45.20	52	57	50	Fair and sunny. Windy			
28 45.11 45.24	—	50	—	Rain this evening. Sunny during the day			
29 45.29 45.26 45.26	57	63	56	Heavy showers p.m.			

Summary.				Mornings.		Noons.		Nights.	
Highest temperature observed	55°	...	63°	...	56°
Lowest ditto	38	...	43	...	37
Mean ditto	47.8	...	51.7	...	46.1

Mean of all observations	...	...	...	...	48° 4				
Fair days	...	...	...	...	...	...	...	...	19
Days on which rain fell	...	...	...	...	...	...	...	...	13
Fair days bright	...	...	...	...	...	...	...	...	11
Fair days gloomy	...	...	...	...	...	...	...	...	8

NOTES.—June 15th. Up to the end of May the grass and other crops made but little progress, during the last week they have grown vigorously. Prospects of considerable crops of lea grass, but little seed grass.

PHOTOGRAPHS REGISTERED.

- Messrs. DAVIES BROTHERS,** Weston-super-Mare,
Photograph of Lighthouse on the Flat Holm, Bristol Channel.
- Mr. W. H. M. LEE,** Bethesda, North Wales,
Photograph of St. John's Chapel, Bethesda.
- Mr. H. MOWAT,** Bath,
Photograph of Remains of Bridge between Bath and Wiltcombe.

The Photographic News, July 13, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. PLAYING AT PHOTOGRAPHY—STEIN AND KÖNIG SOUND EXPERIMENTS.

Playing at Photography.—Every day does the army of amateur photographers receive acquisitions of strength. Indeed in this country we should not be surprised if the amount of apparatus and stores employed by ladies and gentlemen who occupy their spare hours in practising the "black art" does not far exceed that made use of by professional photographers. The progress in landscape photography made by us is in a great measure due to the exertions of amateurs, who number in their ranks artists quite as competent as the best professionals. Again, in the domain of portraiture, with such a bold and daring amateur as Mr. Crawshaw, of Cysartliffa Castle, at their head, the dilettanti portraitists of Great Britain are not to be despised, but now and again produce work which takes a deal of beating. In fact, in any exhibition of photographic work, it is quite impossible now-a-days to observe any difference between the pictures of the professional and amateur element, since the exhibitors in both cases usually number among them very capable photographers. At the same time, it is well that those ladies and gentlemen who are desirous of taking up photography as a pastime should well understand what they contemplate. It is not sufficient to purchase a camera and a collection of chemicals to produce the bijou landscapes of a Russell Manners Gordon, or the bold finely-conceived studies of a Crawshaw. When you have bought a mowing-machine, there is still the lawn to cut, and this is not to be done by looking on, as many a young gardener has found out to his cost. The would-be photographer observes how easy it is to focus and develop a plate, and as it is only a matter, apparently, of possessing a dark room and a stock of apparatus and chemicals, there is no reason, he thinks, why he should not throw himself at once into the very middle of the thing, since he has money enough to acquire the requisites. He may, if he has enquired, hear something of the disagreeables of the nitrate bath, but these vanish from his mind at once as he hears of emulsion plates which require no bath at all, or the singularly ingenious apparatus of M. Warnerke, of which, so he has heard, you have merely to turn the handle to get as many nice pictures as you want. The misguided youth is on the brink of embarking upon that mysterious voyage of alkaline development before he has learnt even to know the vessel that carries him. As well tell a captain he need know nothing of navigation, since his ship will be propelled by steam. To hear some people, neither a knowledge of the principles of art or science are requisite to the practice of photography since the improvements that have recently been made. Nay, one need not even have recourse to a dry plate process to secure photographs in a free and easy manner. You may purchase an apparatus having attached a series of bulbs and elaborate contrivances, and without touching liquids or weighing out a lot of corrosive substances, you have merely to work away mechanically, pressing a bulb here, screwing a winch there, and adjusting a button or two, to obtain your picture. Perhaps you may be diffident about the apparatus producing a good photograph, but on this score your mind is soon set at rest, for a series of excellent views are exhibited all emanating from a similar machine with a man at the end of it. But then the man may not have been the duffer you yourself will prove when you once begin to work and find yourself, after some exercise of mind, of wiser, if of sadder disposition. What man has done, man can do, is a very good precept, and one that looks exceedingly well in a fine Italian hand at the top of a copybook. But in photography, as in most other things, this qualification of itself is not sufficient to command success. We know there are many

who would have young people believe that there is nothing so easy as photography, only you must buy their lens or their peculiarly prepared patent actinic bromo-chloroformed pellicle, the exposure of which is only half that of wet collodion plates, while the results are ten times as good. And here we may put in a word of advice to amateurs not to be misled by the beauty of results which are produced by this or that plate or one or other patent lens. One of these days we shall have a manufacturer of hyposulphite of soda sending round specimens, magnificent portraits and landscapes, to show how nicely his fixing agent works, and what pictures those photographers who employ it are capable of securing. No doubt, proofs and specimens are worth looking at in a fashion by those thoroughly initiated, who can form some idea of the depth of focus of an instrument, or of the tone and texture of a paper; but with amateurs, who have little experience in such matters, a photograph teaches little or nothing, and, on the whole, is rather liable to mislead than anything else. For all this, we would not dissuade ladies and gentlemen from taking up our charming art. Those who will give the subject their earnest attention, and steadily resolve not only to learn by precept but by practice, will produce something more than mediocre photographs. There are several ladies of our acquaintance who are very competent photographers—some, indeed, who in their own branch are not to be beaten—but then they have not adopted photography for the purpose of gratifying a passing whim, but in order to prosecute an art with which they could feel some sympathy. Mrs. Bramey, who recently accompanied her husband round the world in the yacht *Sunbeam*, is said to be an accomplished photographer, and to have used her taste and skill to some purpose during her long and chequered voyage; Mrs. Julia Cameron, as everybody knows, has executed several works of note; and the names of other ladies might also be mentioned, taken from the catalogues of exhibitions, who rank almost in the first line of photographers. The art is, indeed, eminently suited to those with a taste for art and sufficiently earnest of purpose to prosecute their work seriously. To those, however, whose only desire is to amuse themselves for an hour or two now and then, we would say, Try something else. Photography does not mean purchasing a packet of papers with directions, and messing about with a few acids and guano, as most schoolboys think; neither can it be pursued by acquiring a doll's set of apparatus like a child's tool-box. If you have neither time nor inclination, your efforts will simply end in spoiling your clothes and losing your temper.

Stein and König's Sound Experiments.—Dr. Stein seems to have succeeded in photographing records of the human voice in the same way as he previously managed to photograph the tones of the violin. In the latter case he cut a little disk astride one of the strings, and when the latter vibrated the disk naturally vibrated too. A hole in the disk permitted a pencil of light to fall upon a moving sensitive plate; and in this way a curved line was secured, the ups and downs of which were as frequent as the vibrations. M. König, who has also been making experiments of late with a view to securing pictorial records of sound, proceeds to get his pictures in a different way to Dr. Stein. He employs a sensitive or singing flame for the purpose, the shape of the latter being influenced by vibrations set up in the atmosphere, either by a musical instrument or the human voice. But we do not think that M. König has yet been able to secure photographic records of the flame forms he thus produces.

THE BACKGROUND.

BY G. E. SWAIN.*

In a busy picture career of more than a quarter of a century, a devotee with even ordinary observation must necessarily see many things interesting, and some worth com-

* *St. Louis Practical Photographer.*

municating. It does not do to be always patting each other on the back, and congratulating ourselves on the progress of our art, and the giant strides, &c., made in our glorious, yet occult, profession; for to thoroughly put our houses in order would make our stormy days for a long time to come very busy ones indeed. There is a plentiful lack of real artistic knowledge yet in the craft—or, as some will style it, the trade—which if we all mutually help to sweep away with modesty and honesty, and without ostentation, we may at some future period (say fifteen million years hence) be able to notice a marked improvement. Some people may be unreasonable enough to object to waiting so long for the desired result. Now, all such persons I would politely refer to Professor Darwin, Huxley, or Tyndall, either of which astute gentlemen will cheerfully reconcile their patience or impatience, just as they please, by telling them that that is a mere atom of time compared to the eras necessary to thoroughly develop the doctrine of evolution—with which consoling information let us continue our little lucubration without any further prologue, although a due sense of the amenities of modern journalism justifies your humble correspondent in making this rather windy introduction on making his bow to the high-minded, the enlightened, and intelligent readers of *The St. Louis Practical Photographer*.

I have often heard it said that one volunteer is worth two pressed men, and, with a determination not to be always kept in the background, I timidly step forward with my first-born contribution to your worthy journal, on that all-important yet painfully-neglected subject, "The Background." I know many very excellent sun-painters, men who are almost morbidly conscientious in everything they undertake; who run wild about the aspect of their skylight, scrupulously particular about its pitch, height, top, bottom and sides, who become frantic with joy over the questionable success of some new patent collodion; spend the term of half their natural lives in looking for or sighing after a good lens; have experimented on every formula that has ever been patented, published, thought, or dreamed about by the most visionary silver fiend, and possessing an operating-room full of gaudy furniture, rich satin curtains, miscellaneous draperies, some of them very imposing, some very shabby (and all very dirty), where you may see birds, bells, whistles, and fiddles to gammon the children; and one enterprising friend of mine actually has a handsome musical box, which strikes up "Smile as thou were wont to smile!" the moment he removes the camera cloth, and yet, marvellous to state, not a good, competent, practical nor appropriate background! Now, most sun limners imagine that with possession of the aforesaid paraphernalia that their atelier is complete, for, they say, with apparent conviction: Have I not my background, and very dark one; also my "Circumwizzle double-back-action-rotary Rembrandt vignette affector," and my fancy interior, and my picturesque exterior; to say nothing of my Corinthian and Gothic columns, in themselves quite a plethora of resources; in fact, prepared for any emergency—a sort of invulnerable artistic Ajax, armed at all points *cap-a-pie*. While talking to one of these brilliant lights of our profession, the other day, a beautiful little blonde miss, all in white, tripped in to be executed. Our friend at once rushed to business, and as the traditional chair was there in that familiar spot, and had been for the past "decade" (a fact easily attested by the threadbare-appearance of the carpet within a radius of "two feet"), he gave it a twist (the chair, I mean, and not the carpet), and in his hasty opinion every necessary requirement was fulfilled. I should state that the background that was doing duty at that moment happened to be the dark one, and, to my horror and amazement, was allowed to remain there, not at all by inadvertence, but by choice, as I was solemnly told that the contrast would give wonderful strength, and a very stunning effect. Well,

it did, and the stunning began with me. Such a picture could be nothing else but a chalky hobgoblin.

Next came an old couple to tax the resources of our model operating-room, and, like all loving couples, they desired their pictures to look at or towards each other. Here our Knight of the Tripod was in somewhat of a quandary; both of the old people having pale blue eyes, almost the colour of grocery milk, neither could very well face the light. A Rembrandt effect on one and not on the other might be productive of much unfavourable criticism on delivering the pictures. Turning the negative when making the print cannot well be done, so there was no alternative but to sit one of the twain on the other side of the room; and then began such pulling and hauling of scenes, and a scrunching and squealing of rollers, and the headrest nearly inserted itself twice into the picturesque exterior before our artist settled himself to work again. I saw a troubled expression on his usually happy face, and easily divined the cause. The fact is, that his light never did work well on that side of the room—*forsooth*, as if any skylight ought to exist that you cannot work with equal effect and facility, no matter from which side of the room; and I venture to say that any one who has a skylight that cannot be so worked is like a one-armed soldier, and left-handed at that, for with the choicest instruments, the purest chemicals, and the daintiest manipulation, your success can only be comparative without the proper light.

Now, just to have so is not the purpose of this modest little article; and this reminds us that we started with the intention of saying something about backgrounds, so *revenons a nos moutons*, or back to our backgrounds, in good Saxon. If I am ever unfortunate enough to own a gallery, I'll develop a little plan of my own for a background that I have given much thought to, yet, strange, I have never communicated to any one—*i.e.*, to have my background in the shape of a small panorama, and to work like one, I mean, but in a more simple manner, on two vertical rollers, and the ground working horizontally backwards and forwards in size—say, about eight feet high by fifteen, twenty, or thirty feet long—beginning with a perfectly plain tint and a very light shade of grey, and imperceptibly descending to a darker grey, but by no means very dark, as I think that very dark grounds are about as bad as long sermons—an abomination—and instead, as some contend, of throwing out or relieving a picture, absolutely kill it. This is more especially the case in vignette pictures. I should take care that the dark end of my ground would graduate from the light, so that the sitter would always have the background an infinitesimal shade darker on his light side than on his shadow side. By one or two turns of the roller you can have any degree of ground to exactly suit your subject in either his costume or his complexion. Many vainly try to obtain this end by manoeuvring the clumsy grounds they have, but all to no purpose. Very rarely, indeed, are they successful; whereas, with this accessory you might give a wide berth to the artistic interior and the picturesque exterior, and, as for the circumwizzle, delegate it to the nearest junk shop, where it properly belongs. Bear in mind, I am neither peddling nor puffing any crazy patent. Having read and inwardly digested the remarkable prospectus of our worthy Editor, I reverence and respect both, and govern myself accordingly. All I wish to do is merely to ventilate what may appear a crude idea, which may fall as harmlessly as a snowflake in the river, or it may unexpectedly germinate, blossom and ripen in the fulness of time, all to the honour and pleasure (but not profit) of the obscure and blushing writer. I know it is difficult to uproot old customs. Ruts are hard things to get out of. Only fifty years ago the most cultivated and civilized people in the world—the French—cut their hay and corn with a sickle. Fancy stooping at that work all day, as they used to do, from 4 a.m. to 7 or 8 p.m., with only a few minutes' interval, cutting only just a mere handful at a time! And would

you believe that it took many, many years to introduce to them the now old-fashioned scythe, with which they could work standing erect in a natural position, and with one sweep fell twenty times the quantity; and at this day they stoutly ignore most of our labour-saving, new-fangled Yankee agricultural improvements.

If I were out of business (which, happily, I am not), and prospecting around for a likely thing to embark in, I should at once commence the manufacturing of these backgrounds. I have probably not, nor have I tried hard to make myself sufficiently understood in this paper to answer to any one for a working plan or model; but should any individual be bold enough to enter on this new industry, the writer would cheerfully give him all the necessary details free gratis for nothing.

In closing these remarks, he would say that he claims to be no prophet nor reformer, and would not so be "counted in" on any ticket; nor does he consider himself "a wise man from the East," but simply desirous to awaken a keener interest on a subject to which too much importance can never be attached, and one, alas! that can very easily be neglected.

On these grounds alone (no pun intended) our good and worthy editorial Cerebus may with safety give a corner of his valuable space in furtherance of a motive at once so laudable and disinterested.

HOW TO SHORTEN EXPOSURES.

BY GUSTAV WEHL.*

How general is the interest felt in this subject may be gathered from the circumstance that the Photographic Society of Vienna has offered a prize for any method that shall materially curtail the ordinary periods of exposure; while, if further proof were wanting, it is to be found in the fact that photographers are always willing to listen to any means which has the same end in view. A short exposure is for many reasons to be valued, and one of the most important of these is the fact that it multiplies the chances of getting a good picture, for it enables one to seize the proper expression at the right moment in a portrait, and also to secure a natural look or smile which is only possible in the case of brief exposures. How many times do we hear the complaint that the expression in a portrait is not a happy one, or that the proper expression has not been caught at all. Hence the shortening of exposures must always remain one of the principal aims of the portrait photographer. Whether it is possible to shorten further the exposure of a plate by increasing sensitiveness of our chemicals is a point I will not here discuss; but it seems to me that optics and the technical treatment of the subject are more likely to help us in our endeavour.

The proposition made some time ago to expose the plate to light after it has received an impression of the object was a step in the right direction, but it was a method of little use, since the light impressed upon the plate in this way covered the shadows, and therefore weakened these latter in the picture. The after-exposure of the plate must, before everything, permit of the gradations of light and shade to continue in their true relation, if it is to be of any real value. This I am enabled to bring about by changing the diaphragms during exposure. Without a diaphragm, and therefore with a full aperture of the lens, no practical photographer will care to work, unless he does not care to obtain sharp and harmonious pictures; for this reason it is customary to work with a second, third, or fourth diaphragm, as the case may be. If, however, a diaphragm of this kind is momentarily withdrawn before the exposure is complete, it becomes possible to shorten the exposure by about one-third, without in the least interfering with the gradation of the tones in the picture. An exposure of twenty seconds may very easily be reduced to

twelve or fifteen, and in this case the image obtained by the shorter exposure will be preferable, if the latter is so arranged that for a period of nine to ten seconds the plate is exposed with a diaphragm, and during the last three seconds this is withdrawn. To make the picture quite successful it is only necessary that the withdrawal of the diaphragm should be quick and certain, so that the lens sustains no shaking during the process. To do this I have arranged my lens so that by pressing a spring under it I can at once withdraw the lens without attracting the attention of the sitter or permitting the camera to be shaken.

When it is necessary to work with very small diaphragms, or to have recourse to very large lenses of four, five, or six inches diameter, in which case an exposure of one to two minutes is necessary, then the proportion of shortening the exposure is larger still. As a rule the time of exposure may be so divided; three-quarters of it with diaphragm, and one quarter without. This proportion not only permits one to give a shorter exposure, but the image produced possesses much more harmony in its details and gradations than would be the case if the diaphragm remained in the lens during the whole period. Experience will, however, soon teach the proportion which the first portion of the exposure should bear to the second, but it is well to bear in mind that in the case of short exposures (from ten to twenty-five seconds) the after-exposure should never exceed one-fourth of the whole duration, while in the case of longer exposures it may be set down at one-sixth. The following table may be of use:

Exposure under ordinary circumstances.	Shortened Exposure.		Total.
	Preliminary Exposure.	After Exposure.	
15 seconds	7 seconds	2 seconds or $\frac{1}{2}$	9 secs.
42 "	18 "	6 " or $\frac{1}{4}$	24 "
1 min. 12 "	28 "	7 " or $\frac{1}{5}$	35 "
2 " 24 "	50 "	10 " or $\frac{1}{6}$	1 min.
1 hour	32 min.	3 min. or $\frac{1}{20}$	35 min.

In this table I presume that the third and fourth diaphragms are made use of.

THE PRODUCTION OF NEGATIVES SUITABLE FOR PRINTING IN NATURAL COLOURS.

BY LEON VIDAL.*

WHILE prizes are being offered for various improvements in photographic science, it appears to be an opportune moment just now to call attention to the immense interest which attaches to a method of executing clichés which are capable of reproducing objects in all their relative value. This question is one of the most important of our art, and we do not wish to see it neglected for other matters, no doubt interesting in their way, but of less importance.

Although it is possible to secure very perfect results in a photograph, it is well known that the least negligence or the omission of one detail or another in the manipulations militates against the production of a perfect image. The cliché or negative is no doubt the principle upon which everything else depends; if it is bad, or if it is inexact, so far as regards the relative value of the tints and tones of the object reproduced, it is impossible to get a satisfactory image. Now, with the exception of grey or black engravings and monotone sketches, there is always the difficulty in photography of having to reproduce various colours. In taking landscapes, in which the greens and the yellows are not too vigorous, their luminous value is not readily reproduced, and the same may be said of the yellows, the reds, the greens, and the browns

* *Photographisches Correspondenz.*

* *Moniteur de la Photographie.*

in a picture, which are not reproduced upon the negative in their relative value.

This effect or cause of error is known to everybody, and it seems to us only right that some means should be taken to combat the defect, and to encourage those who occupy themselves with its destruction.

In our opinion this is a most important point to study, for at present one may well accuse photography of falsifying all the tones. It is necessary that we should be able to prepare sensitive films whose impressionability should be the same under the influence of all rays which are reflected, no matter what their colour is; or that we should have it in our power to place in the path of the reflected rays and between them and the sensitive film (before the lens) a translucent substance endowed with the property of identifying the simultaneous action of every one of the rays irrespective of its colour.

The idea of M. Ducos du Hauron, applied not to the formation of three distinct clichés, but to one sole negative, indicates the manner in which the solution of the problem might be arrived at. In this case it would be necessary to have before the lens a disc formed of segments of coloured glass, the one green, another blue, and a third orange, and the surface should be in proportion to the different periods of exposure which would be necessary for the preparation of three distinct clichés with the various glasses. The disc would be provided with an arrangement to give it a rotatory motion.

A cliché produced in this way should produce the same effect as one taken from a picture in grey monotone. The method might be somewhat impracticable for animate objects, but might well be tried of still objects. We only cite it in order to illustrate our idea more fully. It would be possible also, no doubt, either by varying the nature of the product introduced into the sensitive medium, or by modifying the development, to bring about the result desired.

We are of opinion that the establishment of a prize to be awarded for the best process which leads in the direction of securing clichés of relative value to the objects photographed will be productive of much good, and induce investigators to bend their steps towards this goal; and we believe that we are rendering a service to photography in invoking attention to such a subject of all those desirous of enriching the art with a new and precious discovery.

ARCHÆOLOGY AND PHOTOGRAPHY.*

THE second volume of the late Lord Dunraven's "Notes on Irish Architecture" has now appeared, and the work is thus completed. The book cannot be called light reading, but it is a careful and trustworthy record of extremely interesting and valuable remains which every year are likely to become more mysterious by the transformations of time. The ivy-grown towers and ruined arches, rough cairns, and circles of uncemented stones, which are the existing monuments of early architecture in Ireland, are minutely described in Lord Dunraven's work, and the assistance of the autotype process of permanent photography has been called in to place the picturesque ruins before the reader with peculiar reality and beauty. The work was left in a fragmentary state by Lord Dunraven, but has found in Miss Stokes an editor of considerable attainments and judgment. Her appendix on the vexed question of the Round Towers of Ireland is a remarkably clear and persuasive, if not exhaustive, statement. Professing to give Lord Dunraven's views as well as her own upon the subject of the weather-beaten towers which astonish the wayfarer in desolate villages and on remote hill-sides in many parts of Ireland, she arrives at the conclusion that they were built in the years between the close

of the ninth century and the middle of the thirteenth, as places of refuge for the ecclesiastics in times when the Northmen were ravaging the coast and making their way inland, and when the native Irish themselves had lost their ancient awe of the sanctity of the church. Bells were afterwards hung in them, like the silver bell, of wonderful sweetness, which once swayed in the Rattoo, and which, after it was thrown into the river Brick to keep it from the enemy, the peasants used to hear, or thought they heard, sounding its melancholy note beneath the water. All theories of the pre-Christian origin of the towers are summarily dismissed, and the round belfries of San Giovanni Battista in Ravenna, Dinkelsbühl in Bavaria, &c., are compared with the more isolated towers which long have been the favourite subject of discussion among those interested in early Irish architecture. A list of one hundred and eighteen round towers in Ireland, and of twenty-two abroad, is given, and a map is added to show that in Ireland the towers were placed on those coasts and rivers which were chiefly infested by the Scandinavian pirates. The book, however, must not be supposed to be devoted exclusively to the round towers. The owner of the beautiful manor of Adare, rich in ruined cloisters, the companion of Montalembert in one of the journeys when that illustrious Frenchman was collecting the materials for his "Monks of the West," Lord Dunraven was not insensible to the grandeur and importance of such ruins as those of the lonely monasteries which stud the western coasts of Ireland, and attract pilgrims to the wild rocks of the Skelligs. Beginning with the remains of the Pagan forts, heaps of stones hardly to be distinguished from those deposited by the slow action of Nature herself, he passes to the early Christian cells, and so to the primitive churches like St. Benen's Temple, which rises with its two gables formed of enormous blocks of stone on the precipitous edge of a limestone cliff in Aran Mór, at the foot of which rolls the Atlantic. One interesting practice of the early builders is related in the concluding essay on the history of Irish architecture. Over the doorway of many of the cells and oratories five or seven quartz stones, rounded and waterworn, whose whiteness is in marked contrast with the dark slate of the walls, are set in the form of a cross. These white stones must have been carried up laboriously one by one from the sea-shore far below by the builder of the cell, to set them in the wall, and so stamp his dwelling with the symbol of his faith. The relics visited and described by the author were not all overlooking the sea. The cathedral and tower of Clonmacnois were in the very centre of Ireland. The crumbling ruins of Leabamolaga, under a tall ash-tree, with a little mountain stream running along their south side, are in the midst of a delightful inland scene. The photographs show that not alone antiquity, or their beautiful situation, gives value to the remains, but that many of the buildings possess great architectural merits, and go some way towards proving the existence of an early period of civilization in Ireland, such as is attested by the evidence of manuscripts, and by the legendary history of the Isle of Saints. No doubt the extent of this civilization is often greatly exaggerated, but it should not on that account be altogether overlooked.

The process of decay, which does not spare the abbey and bell-towers on unfrequented Irish hills, is accelerated in London by the rude hand of the builder. Much is gained to health and convenience, but something is lost to the picturesque, by the removal of such landmarks of old London as the Oxford Arms Inn, which lately stood in Warwick Lane, with its quaint courtyard surrounded by dark wood galleries, and its "windows that excluded the light, and passages that led to nothing." When this ancient hostelry was about to be pulled down in 1875, a few artists and others interested in the antiquities of London determined to secure photographs of the ancient building, and so preserve the one thing about it which was really worth preservation. The proposal was made known

* *The Times*. A Review of "Notes on Irish Architecture," by the late Earl of Dunraven. Edited by Miss Stokes. Vol. I (1876), Vol. II (1877). London: George Bell and Sons. "Old London." Published by the Society for Photographing Relics of Old London. 1877.

in our columns, and received so much support that it was resolved to continue the work in similar cases, and a "Society for Photographing Relics of Old London" is now in existence. The photographs published by the Society comprise not only six views of the Oxford Arms Inn, but also houses in Wych Street and Drury Lane, on or near to the site condemned by the Metropolitan Board of Works, and St Bartholomew the Great, with Cloth Fair, a true Hogarthian background. Already in 1760 St. Bartholomew the Great, the chapel of the ancient priory in the close of which the great fair was held, was thought by antiquaries a precious relic. Maitland wrote, "On the south side of this church, the centre part of the beautiful cloister, consisting of eight arches, is still remaining, but it is reduced to the mean office of a stable." To judge from the appearance of the ancient houses depicted in the photograph, Cloth Fair has not long to be. Indeed, a building does not come properly within the original objects of the Society until it is threatened with removal.

Subscribers are asked to give intimation to Mr. A. Marks, Long Ditton, S.W., of the intended demolition of interesting buildings in their neighbourhood, and this must be done in good time. For example, it was intended to photograph, in 1876, some picturesque almshouses at Deptford, but when the artist went down to select the points of view for the photographer, the venerable relics had already been pulled down. We trust sincerely it is not meant that the gatehouse of Lincoln's Inn, in Chancery Lane, is also in danger, but that also, and some sets of brick-built chambers in Old Square, with curious chimneys, have been photographed for the Society. It may be hoped that, although the chambers fronting Chancery Lane will be pulled down in sections, the Benchers will preserve the gateway itself. The member of the Society who built this fine gatehouse at his private charge was a Knight of the Garter in Henry VIII.'s time, an honour which never now falls to lawyers. His arms (those of Sir Thomas Lovell) still adorn the gatehouse, on which are also placed the bearings of the Lacey family, Earls of Lincoln, with three wheat-sheaves for their constableness of Chester. Ben Jonson is said by Fuller to have laboured as a bricklayer on part of the buildings of the Inn; but the work he did in respect of Bartholomew Fair will not be so readily effaced from the earth. His play is freely quoted by Mr. Morley in his interesting book on the Fair. The photographs now published are clear, permanent, and taken from well-chosen points of view, and they show that even the blackness that comes of saturation for centuries with London smoke may have its æsthetic value.

THE EMULSION PROCESS.

THE *Scientific American*, in some remarks on recent progress in photography, gives the following details of the emulsion process:—

"The common method of photography, that universally practised in all galleries for portraiture, and for the best outdoor work, is known as the wet plate process. It consists in sensitizing the collodion plate by dipping in a liquid charged with nitrate of silver. The sensitization is effected in about three minutes' time: the plate is then withdrawn from the bath, quickly placed in the camera, and the picture taken and developed before the plate has time to dry. When all the chemicals are in good order, the bath pure, the exposure rightly timed, and the development skilfully done, the most beautiful results are produced. Indeed, there seems to be no room for improvement in picturesque details, as realized by the best wet plate operators.

"But the method is attended with many inconveniences and irksome details. The gallery photographer must keep in readiness a first-class bath, the purity of which is lessened by every plate that goes in; and the bath soon requires renovation. The plates cannot be prepared and sensitized so as to be ready for use in advance of the

opening of the day's business, but must be prepared and developed after the customer comes. Should the negative prove unsatisfactory, a new plate must be prepared and developed; and thus the bother of the plates involves the loss of so much time that the operator has little chance to consider the best positions for his subject, or to study the artistic accessories that go to make up a finished picture. For outdoor work, wherever the photographer goes, he must lug his bath along, even to the mountain top, and must there have a dark tent, and water for washing and developing; otherwise his efforts are fruitless. For several years past it has been the study of photographers to discover a reliable method of preparing highly sensitive plates without the use of the bath—a method by which the plates could be used when dry. Among the results of these efforts are a variety of dry plate processes, some of which, in the hands of skilled operators, yield excellent results. But nearly all of them have proved less sensitive or less excellent in their results than the wet process; and none have been able to compete with the latter for portraiture or gallery work.

"The French Photographic Society in 1876 offered a prize for the best dry process which should unite rapidity with all the other qualities that go to make a good negative. The competition was closed in December last, and the jury have recently awarded the prize to Mr. Alfred Chardon. The process appears to have advantage over some of its predecessors, but there are inconvenient details about the development, and some uncertainty in the summering and wintering of the emulsion; while the prepared plates require twice as much time for taking the picture as the wet plate. Moreover, the process is not suitable for the ordinary routine work of the gallery.

"The author of the new process which we have now to describe, and to which we would direct the attention of photographers as a complete and perfect substitute for the wet process, both for indoor, gallery, portrait, outdoor work, and all descriptions of photography, is Mr. Henry J. Newton, of this city, President of the Photographic Section of the American Institute.

"We have seen the process worked under the author's hands, and examined some of the results. We believe that practical photographers, when they come to examine the negatives and prints, will agree with us when we say that they are unsurpassed by anything as yet produced by the wet process. They will also agree with us that Mr. Newton's process is simpler, quicker, easier, less expensive, and more certain in the excellence of results than the old method. Moreover, for gallery and outdoor work it presents the striking advantage of enabling the photographer to prepare in advance a stock of sensitive plates, and of keeping them on hand ready for instant use when wanted.

"The Newton is an emulsion process. The silver is mixed with the collodion, which remains good for use at any time within a year or more. A glass plate is flowed with this collodion in the usual manner, the plate is then dipped in water; it is then ready for use either before or after drying. The picture being taken, it is developed by simply flowing the plate in the ordinary manner with a solution of carbonate of soda and pyrogalllic acid; then fixed with hypo or cyanide, as usual. This is all the manipulation required for the most beautiful, clean, and splendid negatives. As to sensitiveness, the Newton plates require, in the gallery, less than half the time necessary for wet plates. Portraits by the Newton plates are taken in from five to ten seconds; while the wet process, same light and lenses, requires from twenty to forty seconds. For outdoor work the Newton plates yield as good or better instantaneous pictures than wet plates.

"The exact formula for the emulsion has not yet been made known by Mr. Newton, but will in due time be freely given to the public. It is sufficient for the present to say that the emulsion is prepared with an excess of free nitrate of silver, which is allowed to remain for a certain number of hours, when chlorides are added."

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COMMERCIAL DRY PLATES.

CAPTAIN TURTON returns to the subject of commercial dry plates, but states that he regards it as a scientific rather than a commercial question. We must confess that to us it appears to be essentially a commercial question, and that the grievance complained of must find its remedy in commercial issues. If a tradesman supply his customers with bad wares, they will soon cease to be his customers, and his occupation will be, like Othello's, "gone"! The old north country motto will naturally occur to the buyer, "If you deceive me once, shame to you; if you deceive me twice, more shame to me!" In short, no manufacturer can find his account in the sale of imperfect goods. Failure, utter and ignominious, must be the final issue of such a course. It may be admitted, however, that whilst this is essentially a commercial question, it is something more, as it involves scientific considerations. The photographic dry plate is unlike the mass of goods in trade which may be examined and judged of before they are purchased. They must be bought and used in faith: faith partly in the process by which they are alleged to be prepared, and partly in the trustworthiness of the manufacturer and vendor. The issues depending upon their quality are at times of great scientific importance, and are at all times sufficiently important. The chief drawback which has been at any time alleged to attach to the use of dry plates as compared with wet plates is the element of uncertainty. The wet worker exposes a plate, retires to his tent, and develops at once, and so ascertains whether he has or has not secured a satisfactory negative. If he have over-exposed or under-exposed, if the effect of light be unsatisfactory, if the point of view be ineffective, or if a score of minor points fail to please him in the negative, which were unnoticed on the ground glass, the exposure of another plate may remove every objection. The dry plate worker must take all these risks, and if his vigilance and experience enable him to avoid risk in such directions, it becomes doubly hard that all his effort and skill may be rendered nugatory by defective plates, whether the defect consist in stains, spots, or other of the imperfections which imperfectly prepared plates are heir to, and which are frequently due to manipulative carelessness in preparation. We regret to learn that these and other defects are not uncommon in commercial dry plates.

An enthusiastic and careful amateur, who recently called upon us, stated that, lured by the attractive accounts of the rapidity of certain plates, he had been induced to obtain some, but found it impossible to secure a negative free from defects. Captain Turton proposes a remedy in publicity. He argues, naturally enough, that it is somewhat hard for every photographer wishing to try commercial dry plates

to have to discover for himself which are bad and which are trustworthy. The experiment, he thinks, is too costly and heartbreaking. It is not simply the loss of the value of a packet of plates and all the chemicals used in connection with them, but the waste of time and the bitter disappointment which attend the enlightenment. He suggests that different photographic societies, who may be willing to aid in erecting beacons of this kind, should constitute experienced amateurs corresponding members of their bodies, and that these corresponding members should from time to time frankly and honestly state their experience of trade products in the use of which photographers are interested; and Captain Turton himself offers to undertake such position and duty. That such communications, honestly and ably written, would possess much interest there can be no doubt. But we must candidly admit that we should look for some thorns in the path of the executive of a society which should entertain such reports. Speaking the truth should be in such cases a desirable and safe thing; but there is, unfortunately, an undefined thing known as the law of libel in this country, of which journalists stand in wholesome awe, because of its uncertain and often capricious action: the winner in such a suit being often well-nigh ruined. A mild illustration of the risks of journalists came under our attention a day or two ago. Notice of action for libel having been served on a journalist of our acquaintance, on some frivolous ground, he felt it wise to compromise the matter by a payment of £10. Within a few days he received his lawyer's bill for the preliminary proceedings already taken in preparing for defence, amounting to £70. Thus he was mulcted of £80 for the insertion of what he believed to be an innocent and justifiable paragraph. One of the recognized conditions constituting a libel is the statement of anything which may injure a man in his business. If, then, a society read, or a journal publish, a paper announcing that the plates sent out by the Quinzie Dry Plate Company produce dirty and defective negatives, there is surely risk of the law of libel being put into operation, especially if the manager of such company possess something of that character which Byron claimed when he described himself as "being a Christian, and vindictive"! The journal publishing the report might, indeed, escape, as it has, we believe, been decided that a journal publishing a fair and honest report of proceedings which are libellous in themselves is exempt from action.

The cause of many of the defects complained of is doubtless due to manipulative carelessness and inexperience. There is a natural aim on the part of manufacturers to produce as cheaply as possible, and hence boys and girls are often employed in preparing plates: a bad economy, we submit, as, whilst the operations are quite within the ability of boys and girls, it is difficult to impress either with a sense of the great importance of extreme care. At any rate, we would strongly impress manufacturers of dry plates with the vital importance of securing the utmost avoidance of preventable defects, as a loss of faith in dry plates will effectually ruin their own business, and, by destroying all confidence in such plates, ruin this branch of industry altogether. Possibly if those manufacturers who feel perfect confidence in the excellence of their plates and freedom from defects would challenge the publication of reports of experience with their plates, they might do much to restore confidence, which is at present, there can be no doubt, much shaken.

THE COFFEE PROCESS.

OUR readers will remember details of the coffee process which appeared in our last volume, together with our remarks on the great excellence of the results forwarded to us by our esteemed correspondent, Mr. J. H. Whitehouse. We have recently been favoured with some further charming examples of the results of these coffee plates. Mr. Whitehouse has since the close of last year been in America,

and has only recently returned to Switzerland, and renewed his photographic experiments. We hope shortly to be able to publish his hints on neat manipulation to which we referred in the beginning of the year. Mr. Whitehouse prepares his plates and develops them in a bed-room, and might as easily do it in a lady's boudoir, without leaving stain or trace of his work behind him. He says:—

"I am once more settled in my old quarters here; have conveniently arranged my photographic *table* in my bedroom (which forms my sole laboratory), and feel myself both prepared and impatient to again take up the art of which I am so fond; and I hope to send you from time to time specimens of amateur work such as, I trust, may induce you and others to recognize, as fully as I do myself, that there is nothing superior, more simple, and reliable in the way of dry plates, *than those prepared by the coffee process*, to which I am so wedded. At present I am using some plates prepared in September last, and which have twice crossed the Atlantic; and certainly within that time their sensitiveness has not been impaired in the *slightest degree*, nor do I find it necessary, to-day, to give them any longer exposure than I should have done had they been freshly prepared.

"I avail of the opportunity offered by a friend going up to London to send you four prints and a transparency.

"No. 1 is a view in Prospect Park, near New York. Exposure twenty-five seconds. I found the light in America wonderfully quick, and from miscalculation in this respect spoilt two plates from over-exposure, giving them thirty-five to forty-five seconds, where twenty-five to thirty was ample.

"No. 2 is of the Suspension Bridge at Rouen. Exposure forty seconds, at six o'clock p.m.

No. 3. "Monument of the Cardinals" in the Cathedral at Rouen. Exposure one hour.

"No. 4. A view upon the Lake of Geneva, near to the little river Flon. Exposure thirty seconds; bright light, about eleven o'clock a.m.

"No. 5. A transparency of the last view. Exposure, six seconds in a subdued light.

"The clouds in Nos. 1, 2, 4, are printed in from a negative (also dry plate) exposed five seconds at 6-30 p.m.

All of these pictures were taken with the same lens, the only one which I possess—Dallmeyer's 6 by 5 Rapid Rectilinear, and the stop used was No. 3 for landscapes and clouds, and No. 2 for the interior.

"I have done more rapid work with similar plates; but certainly, with even the above results, *no one is justified* in pronouncing the coffee process a slow one, and in view of such evidence to the contrary I am surprised to see that Mr. G. W. Hewitt, in his paper read before the Photographic Society of Philadelphia, reprinted in your Journal of 1st inst., says: 'With me all dry plates are slow.'

"I have upon a previous occasion given you full particulars of the coffee process as I practise it, and so simple are all the manipulations, and so uniform the results, that no one need fear failure who has met with success by any other method.

"Should any of your readers feel tempted to give a trial to these plates, without desiring at first to prepare them for themselves, I would say that Mr. A. Bauernheintz, of this place (former associate of your old contributor, the late M. de Constance), a most intelligent practical photographer, and who makes use of the same formula as myself, will gladly execute any orders, even for two or three plates as samples; and I need scarcely assure you that to any one passing through this part of Switzerland, and bringing a line of introduction from yourself, I will take great pleasure in showing my 'boudoir laboratory' (in which I take great pride), and all of the little that I know of the 'coffee process.'

All the prints forwarded are excellent, and indistinguishable from the results of the wet plate process. Those of

our readers who may chance in their holiday rambles to be in the neighbourhood of the Lake of Geneva will do well to avail themselves of the privilege of calling upon Mr. Whitehouse, at Ouchy, where he will be easily found.

DESPAQUIS' PHOTOGRAVURE PROCESS.

[THIS method, to which our Paris Correspondent recently called attention in these columns, we now publish in *extenso* from the *Moniteur de la Photographie*.—ED. P. N.]

My process is based upon the observation that an engraved plate should possess a grain in the hollows, while the surface should be of a polished character. It matters little whether the bottom of the deeper hollows, which are to furnish the deep blacks of the image, have a larger grain than the shallower ones, which yield the half tones; the tool of the engraver makes the same kind of markings wherever it penetrates; it is the breadth and depth of the hollows themselves which produce either deep blacks or half-tones, as the case may be. All parts of the plate not touched by the grain should remain perfectly polished, so as not to retain the ink spread over it, and thus soil the whites of the picture.

There is nothing new in these observations, nor do I claim them as my own; neither do I lay claim to the employment of grain in the gelatine; but what I do call my own, and which belongs to me morally, since I have given my process to the public, is the means of making practical use of the observation above made, and this I do by having recourse to a *second very thin film of gelatine which is absolutely free from grain, and which is laid upon the surface of the first and thicker film that contains the grain*. This second film, very thin and without grain, is the main point of the process. It is by its means that I obtain all the delicacy of the half-tones, which, without it, would be heavy and charged with black ink. In fact, the fine half-tones being represented in the gelatine image by a film of gelatine of extreme thinness, it is impossible for the same to cover up and annihilate the grain, no matter how fine it may be; and when the film is dry the grain will be found still in relief, and capable of producing, by the aid of a counter-mould, an engraved plate having in the fine half-tones hollows many times deeper, and consequently capable of producing small half-tones with the same distinctness as large ones. This is but the theory of the process, and I now proceed to practical details:—

Preparation of Paper.

Ordinary water...	...	...	1,000 grammes
Gelatine...	...	...	200 "
Indian ink for giving a slight tint	...	...	20 "
Pumice stone finely ground and sifted through fine linen	...	...	4 "

It is requisite that care be exercised in adding the pumice, for if too much is put in, the grain produced is too close, and the impression will not develop well in warm water; those who employ the process will, however, soon get to know the proper amount that should be used. In any case, however, too little rather than too much should be employed.

I use pumice stone in preference to other powders, because it has a tooth which catches the surface, and also because it is light, and consequently remains well in suspension in the gelatine solution, and does not settle at the bottom, and thus prevent the preparation of the paper uniformly.

It is for the same reason that I employ a gelatine solution of twenty per cent. strength, because it is thick, and the sooner it sets after application to the paper the better, since the gelatine has not then time to settle at the bottom of the film. The gelatine solution for the same reason must not be too warm at the time it is poured, and should only be heated sufficiently to spread in a uniform manner, its spreading being facilitated by inclining the surface.

The gelatine solution should first of all be filtered before the powder is added through a bit of fine linen, and indeed I generally filter twice. After the first operation I maintain my solution warm in a decanter placed in a water-bath. At the moment of application upon the plate or the paper, I shake up the liquid in order to get the powder in suspension, then quickly I cover the mouth of the decanter with a loose piece of linen, and pour out my gelatine, thus filtering it a second time. This second filtration is, however, only for the purpose of arresting the passage of air-bubbles, which form at once on shaking up the solution. To work in this way it is necessary that the gelatine should be pretty warm.

If the precautions mentioned are taken, and there is no fear of the powder falling in a mass to the bottom of the film, the solution may be poured upon a plate lightly coated with ox-gall, which will yield a paper with a very fine polish; the grain arrested by the plate will be found enveloped by gelatine, and not in relief, when dry. But if you do not wish to take so much care in the matter, you may wax a plate, and, having placed upon it a sheet of moistened paper, and driven off all air-bubbles, you can pour the gelatine solution upon this, and let dry. What is wanted is a paper with a thick film of gelatine upon it, containing a very fine powder or grain, which must be equally disseminated throughout the gelatinous mass.

This first film with grain is to form the interior of the hollows of the engraved plate, and when dry it may be preserved for use till wanted.

When required, it is sensitized by being immersed for one or two seconds in the undermentioned solution, according as to whether the latter is still warm or not. If the liquid is too warm, and the prepared paper is allowed to remain therein too long, the grain will dissolve out, and the gelatine will run. The liquid is made up of:—

Water	500 grammes
Gelatine	10 to 15 „
Dichromate of ammonia	15 „

The gelatine paper is immersed in this liquid, prepared side uppermost, and a glass rod is passed rapidly over the surface to remove all air-bubbles. Then it is withdrawn by taking hold of two corners and slipped upon a glass-plate (prepared with ox-gall), the paper side undermost. When dry the sheet separates without difficulty.

I have already explained the utility and indispensability of this second thin film of gelatine, which is altogether free from grain, and it is unnecessary, therefore, for me to make any further remark, except to add that this second film dispenses with the burnishing of the whites, and permits one to obtain the most delicate tones in a photograph. The slight wave-like formation upon the surface of the gelatine which always takes place on drying, and the hardening with alcohol of the gelatine prior to taking the counter-mould in lead, often necessitates subsequent burnishing, however, in those parts where there is no grain from the pumice.

As soon as the paper has received this second film of gelatine, and has been rendered sensitive, it is dried in the dark, and is then cut to a size rather larger than the cliché; the gelatine side is put against the negative, as in carbon printing, and the paper exposed to light for a third longer, or even half as long again if deep hollows are required, than would be necessary to secure a carbon impression.

After exposure, the operator proceeds as in carbon printing, but instead of allowing the impression to adhere to albumenized paper or glass, the former is applied to a sheet of polished steel or copper. When adhering to this surface the image is put under a press and allowed to dry, when it is developed in the ordinary way with warm water. It is necessary, however, to use a little more care in development than if the transport were paper or glass, and especially when dry, for too much heat will speedily bring about a stripping of the film from its support.

I employ either steel or copper for the support, so as to

be able to make the counter-mould without difficulty under a hydraulic press. For this purpose a sheet of lead is employed, and if a hydraulic press is not to be had, then a rolling press can be made use of. The image is covered with a very stout sheet of lead doubled, and the latter is then covered with a zinc plate. This is passed several times through the rolling press until the lead has penetrated into the very finest details of the image.

From the gelatine counter-mould another is secured by the electro type process, which serves as the printing plate to receive the ink, and which may be retouched, if such a process is necessary.

THE PARIS EXHIBITION FOR 1878.

So many rumours have circulated about the postponement of the Paris Exhibition, that our readers will be glad to hear something definite in regard to it. So far, no steps have been taken to stop the preliminary measures which are in progress, and the workmen engaged upon the *Champ de Mars* are still vigorously labouring upon the vast building which is to enclose the international collection. Moreover, we hear that experiments are being undertaken with a view to ascertain the best means of illuminating the building with electricity. The electric candle will, doubtless, be the means employed in the end, and this will be supplied with electric fluid from huge Gramme machines to be worked by steam power. If the Exhibition is only instrumental in introducing into ordinary use electric illumination, and proving beyond doubt that the employment of this valuable mode of lighting is adapted to every-day purposes, this alone will be one great step of progress for which the civilized world will be thankful.

So far as the photographic department of the Exhibition is concerned, matters are apparently in a very forward state. Already the names of all intending exhibitors have been received, and the latter have been requested to vote for a hanging committee. Two delegates are to be chosen, it appears, and the administration committee have nominated four gentlemen, namely, MM. Andra et Chardon, amateurs, and M. Joliot, whose firm of Levitsky is well known, and M. Levy, the successor of Ferrier et Soulier, whose transparent stereoscopic slides are known all the world over.

We have no means of knowing as yet the number of native and foreign photographers who have applied for space, but there is every prospect, notwithstanding the war, that the Paris International Exhibition for 1878 will be no less a success than the preceding gatherings in that capital.

FRENCH CORRESPONDENCE.

PROCEEDINGS OF THE FRENCH PHOTOGRAPHIC SOCIETY—GOUGENHEIM'S RAPID COLLODION—HUSNIK'S PHOTO-LITHOGRAPHIC PAPER FOR TRANSPARENTS—BARDY'S EXPERIMENTS WITH COLOURS—A SUITABLE PIGMENT FOR DARK ROOM WINDOWS—PREPARATION OF EMULSIONS IN LARGE QUANTITIES.

THE monthly meeting of the French Photographic Society was held on the 6th July, when many interesting communications were made. M. Gougenheim, who is well known for the beautiful photographic enamels he has been so successful in producing, forwarded to the Society for trial among its members, several bottles of collodion of a very rapid description. The formula for making this collodion M. Gougenheim forwarded also, and this was as follows:—

Ether	535	cub. cents.
Alcohol at 40°	465	„
Pyroxyline	10	grammes
Double iodide of potassium		
and cadmium	5	„
Iodide of ammonium	4	„
Iodide of cadmium	24	„
Bromide	3	„

The silver bath employed is up male of seven per cent. strength, and the development of the image is undertaken by means of an iron solution male up in the following manner:—

Ordinary filtered water	... 1 000 cub. cents.
Ammoniacal iron	... 50 grammes
Sulphate of copper	... 20 "
Acetic acid...	... 35 "
Alcohol at 36°	... 20 "

If the image should not appear to be sufficiently vigorous, it is intensified with the undermentioned liquid:—

Distilled water	... 500 cub. cents.
Pyrogallie acid	... 5 grammes
Acetic acid	... 20 "
Alcohol at 36°	... 80 "

The silver solution which is added to the above when necessary to intensify is a three per cent. solution. M. Truchelet, who has tried this collodion, declares that by employing the iron bath indicated by M. Gougenheim very great rapidity indeed may be secured.

M. Schœffner the same evening exhibited to the members some specimens of photo-lithographic paper prepared by M. Husnik for transferring to stone or metal images in line or in grain. This is the way in which M. Schœffner told us the paper is employed. One hundred grammes of bichromate of potash are dissolved in 1,500 cub. cents. of distilled water, and ammonia is added until the liquid becomes yellow and begins to have an acid reaction, when 400 cubic centimetres of alcohol are added. This preparation will keep in good condition by adding to it from time to time an additional quantity of ammonia and alcohol. When you desire to sensitize your paper, you carefully pour, as if decanting, the liquid into a flat dish, and steep the sheet of paper, its prepared side uppermost, in the solution. It is then withdrawn forthwith and dried. When wet, the surface should not be permitted to touch anything. In inking the sheet after printing, ordinary lithographic ink is employed, of which five parts are taken with a little wax, the whole being dissolved in essence of turpentine, until it is of the consistence of honey. The printed sheet is placed upon a piece of cardboard, and upon it is dropped a little of the ink in question. The latter is spread over the surface by means of a bit of very soft linen, and the excess is subsequently removed by employing a fresh bit of linen and passing it over the print. The latter is then of a uniform grey tone, but nevertheless contains quite enough ink for the purposes of transfer. Five minutes after this operation the sheet is placed in water, and you proceed with the development ten or twenty minutes afterwards. The development of the image is effected with the aid of a fine sponge. As soon as the picture appears in all its details, it is put between two sheets of blotting paper, and sponged softly, being slightly pressed meanwhile. After the transfer has been thus treated, it may be applied to the surface of stone or metal. Every time the image is subjected to pressure, which is increased in the press several times, a sheet of dry paper is put upon the image to absorb the moisture. It is then moistened again, passed through the press several times, and then well moistened once more; finally, the paper backing of the image is carefully removed. The whole of the picture will then be found resting upon the stone or metal, and it is treated in the same way precisely as an ordinary transfer. When zinc is employed, in order to prevent the sheet from attaching itself too firmly to the metal surface the impression is plunged after development in a bath composed of one thousand grammes of water and fifty grammes of alum.

A skilful chemist, one M. Bardy, has communicated a very interesting note upon the subject of a substitute for glass in laboratories or dark rooms. M. Bardy has discovered by experience that the yellow glass usually employed for such purposes admits, under certain conditions, enough

light to produce a positive upon glass by contact printing. He therefore set himself to study the different colouring matters which may be employed, and which are for the most part the products of coal tar. He has examined them all by means of the spectroscope, and he has found the best of all to be *crisoidine*. This substance, which is of an orange-yellow, is soluble in alcohol and in water. It may therefore be employed both in the form of a varnish or paste for paper and glass indifferently; by mixing with gelatine a tinted pellicle may also be produced. It is a product, however, which is to be obtained at the present moment only of one manufacturer, and this manufacturer is in England. M. Bardy has convinced himself by repeated experiment that this colour does not permit any chemical rays to pass, while at the same time it admits sufficient illumination for a dark room or laboratory.

M. Bardy, who has adopted the process of M. Chardon, and who has sometimes occasion to prepare three litres of emulsion at one time, naturally feels the labour of producing this large quantity very considerable, and the fatigue consequent upon such a task has led him to make some modification in the process. He now finds he is able to allow the preparation of the emulsion to proceed mechanically: he simply places the vessel containing the liquid to be shaken upon a sort of balance, or scales; this balance works simply by a stream of water, which automatically turns the balance. Every time the balance goes to one side or the other, the emulsion is, of course, shaken up.

The interesting meeting of which I have spoken concluded by the presentation on the part of various gentlemen of collections of carbon prints, and of pictures produced by Scamoni's greasy-ink process. A demonstration also took place showing the nature of the development which is necessary in the case of dry emulsion plates prepared in accordance with M. Chardon's process.

ERNEST LACAN.

INVESTIGATIONS ON IRON DEVELOPERS.

BY ROTTIER AND WALDACK* (*Chemisches Centralblatt*).

THESE investigations on iron developers were carried out with the view of ascertaining which are the substances most suitable for the composition of iron developers, and what are the conditions under which they give the most favourable results. All the experiments were made on the wet collodion process, and in each experiment two negatives were prepared under the same conditions, and treated with different developers. In order to obtain two equally latent images, a stereoscopic apparatus with a glass plate of nineteen by eleven cm. was employed, the objects taken being the same in each case. After exposure to light in the camera, a strip of glass was placed in the middle of the layer, and first one half of the plate developed, then the other half. In another experiment the glass was scratched along the middle by a diamond, and after preparation and exposure broken in half. The following observations were made:—

1. *Influence of a Concentrated Iron Solution.*—It was found that while a dilute solution developed slowly a thin, transparent violet image, concentrated solutions gave at once dark, dense pictures. A weak solution penetrates through the layer of the collodion, producing a precipitate of silver throughout the whole of its thickness, while a concentrated solution yields an image only on the surface of the layer. The stronger the solutions, the stronger are the negatives. The manner in which the development takes place, apart from the concentration of the solution, influences the consistency of the precipitate to some extent, different results being obtained accordingly as the developer is left at rest on the glass, or moved up and down it.

2. *Influence of Acids.*—In the above-mentioned experiments solutions of ferrous sulphate without addition of

* *Journal of Chemical Society.*

acid were used. It is known that the development of images is retarded by acids, different acids showing different results. Organic acids in general produce black precipitates, excepting acetic acid, which gives a very clean negative, and is of great value to the photographer. Glacial acetic acid, commercial acetic acid, and wood vinegar, all give the same results. Sulphurous acid yields a worthless picture, whilst the action of sulphuric acid is as advantageous as that of acetic acid. The greater the quantity of acid used with the developers, the less quickly is the photograph developed, and the weaker is the negative obtained.

3. *Influence of Various Iron Salts.*—With salts other than ferrous sulphate different results are obtained. With regard to the fineness and strength of the images obtained, the following order is given:—1. Ferrous nitrate develops weak images. 2. Ferrous sulphate. No difference is perceived in the results of this preparation, either obtained from the metal or from its ores by the action of sulphuric acid. 3. A mixture of equivalents of ferrous sulphate and cupric sulphate acts in the same manner as ferrous sulphate alone. 4. Ammonio-ferrous sulphate. This salt has a more advantageous action than ferrous sulphate, less time being required for exposure. 5. Ferrous acetate is to be preferred to the former, as it requires still less time of exposure to the light.

4. *Observations Regarding the Use of Ferrous Acetate.*—By adding a small quantity of ferrous acetate to the ordinary iron developer its sensitiveness is increased very considerably, intense negatives of harmonious tone being obtained. With too large a quantity of the acetate, however, a confused photograph is obtained. Indeed, the extraordinary sensitiveness of this salt, which enables it to produce negatives of great intensity, renders its action, on the other hand, too rapid for the development of powerful pictures.

Correspondence.

O. G. REJLANDER.

DEAR SIR,—Your readers will be glad to hear that steps are being taken to furnish the hitherto unmarked resting-place of the late O. G. Rejlander, in Kensal Green, with a suitable grave-stone. One of Rejlander's old friends, and a sculptor of some note in Sheffield, has generously promised to erect a suitable head-stone, bearing upon its face a bronze medallion of the well-known artist. The medallion is about ten inches in diameter, and the stone bearing it, while simple in design, is of a handsome and solid character.

Of the competence of the gentleman to execute his self-imposed task I need say little. Being a labour of love, Mr. Theophilus Smith may well be relied upon to execute a faithful likeness of the master of photographic art, whose friends and disciples were legion; and when I mention that Mr. Smith boasts of possessing the largest and most complete collection of Rejlander's works, there is little need to tell of the admiration which the sculptor feels for his dead friend. The portrait, I am told, is finished for casting, and the stone has simply to be lettered with a simple inscription to be ready also. Mr. Theophilus Smith's standing as an artist is too well known to require any introduction to photographers; and if he is as successful in the present instance as he has been in the case of two excellent busts of Mr. Roebuck, M.P., and Professor Sorby, F.R.S., recently executed by him, we shall all owe him a deep debt of gratitude. To those as yet unacquainted with his ability, I would mention that there are to be seen just now at the Royal Academy two very able productions from his hands.

Mr. Smith suggests that it would be desirable to make the monument more complete, and to enclose the grave with a coping-stone or rail. To do this satisfactorily, as also to cover certain incidental expenses, I desire to collect a sum of from ten to twenty pounds, and I now invite any

of your readers to aid in subscribing this amount. I shall be happy to give an account of all monies in these columns, if you, sir, will permit me; and I trust to be able to forward you, in a few weeks' time, another note stating that the whole work has been well and satisfactorily completed.—Faithfully yours,

H. BADEN PRITCHARD,
Late Treasurer to the Rejlander Fund, and Hon. Secretary to the
Photographic Society of Great Britain.
Royal Arsenal, Woolwich, July 9th.

NOTES ON GOLD.

SIR,—The following notes on gold may probably prove useful to many of your readers.

NOTE 1.—Gold is the most valuable—and probably the longest known—of all metals. From the remotest period it has been esteemed for its beauty and permanence. At the present day it contributes, as we all know, to the enjoyment of life. This may be going beyond the limits, and photographers will say we only wished to know about the chloride of gold; but all in good time. But the impatient must remember that without the genuine article "gold" there would be no chloride of gold. A few incidents I also noted about the genuine article, which may be of interest to some: They are these. In California a mass of gold weighing twenty-eight pounds was found; whilst in our Colonies one weighing one hundred and six pounds was dug out, containing upwards of ninety-one per cent. of pure gold and nearly eight and a half per cent. of silver, being as pure as the English sovereign, or, in trade language, twenty-two carats fine.

Now for the impatient comes the well-known chloride. Trichloride (Au Cl_3) is prepared as follows: Gold, one part, is dissolved by aid of heat in nitro-hydrochloric acid eight parts, and evaporated down to dryness, and allowed to crystallize.

PROP.—Orange red crystalline needles, deliquescent, soluble in water, in ether, and alcohol, and forming a deep yellow solution; at the heat of 500° Fahr. it suffers decomposition, chlorine being given off and pure gold left behind; it is reduced by oxalic, sulphurous, formic, and phosphoric acids.

NOTE 2.—As well as most metals to metallic gold, it combines with several metallic chlorides, forming a series of double salts.

USES.—Its most important is in photography, where it is used as a re-agent, quantities being made for toning photographic prints. To some extent it is used in electro-gilding, with excess of bicarbonate of potash.—I remain, yours truly,

C. R. P. VERNON.

Grafton Underwood, Kettering

P.S.—I have an excellent toning formula; if any of your readers desire it, they can have it on application to me. As I shall be going a short tour, they must direct to C. R. P. Vernon, Alveston House, Alveston, Gloucestershire.

[Our correspondent will do well to send us the formula for publication, which proceeding will save him trouble, and extend the benefit he contemplates.—ED.]

COMMERCIAL DRY PLATES AND THEIR VALUE

SIR,—I see that you have called attention to the letter I wrote you under the above heading in your paper of June 22nd, and am glad that you have done so, thinking, as I have long done, that "commercial dry plates" should be looked on by all photographers (and by a scientific journal devoted to photography especially) in other than a mere commercial point of view. I may say that I used the word "commercial" in my letter more with the view of calling attention to it than any other reason, knowing well that some of those who "manufacture" the dry plates care much more about their own pockets than the advancement of photography, and that my letter would certainly be read if these gentlemen thought their monetary interests would be affected for good or evil in any way, while it would be

neglected if the mere scientific aspect of the value of dry plates were brought before them. In taking the "commercial" view I quite agree with your article, for of course a public journal cannot express its opinions, good or bad, of articles advertised for sale in its pages; but I never expected the PHOTOGRAPHIC NEWS to do more now than it has done hitherto by giving publicity to comments which bear directly on the advancement of the photographic art in a public sense, nor do I ask more now.

The value and the merits and demerits of various dry plate processes have occupied the columns of the photographic journals of various times very fully, and perhaps no person has taken more advantage of this fact than Colonel Stuart Wortley, especially in his criticisms on the processes and inventions of others.

That the value of dry plate processes to science and art is increasing, and must increase, is evident from your own recent pages. In your three last numbers you allude to the value of dry plates in micro-photography, in relation to what the French Government is doing in its museums and galleries, where dry plate processes alone are admitted—this must give an important impetus to dry plate work in France. In your French Correspondence of June 22nd M. Ernest Lacan alludes to the exclusion of photographers from the public museums and galleries of France, owing to the mess made and injury done in working the ordinary wet process, and the damage done by them. Dry plate processes must now be used, and our so-called "professional" photographers must now learn how to handle dry plates, either by the alkaline or acid mode of development.

With regard to the value of criticism of dry plates, the fact is that emulsion processes are so (comparatively speaking) in their infancy, that those who prepare the plates should court inquiry as to their various qualities, as to rapidity and general excellence of final results; and the various photographic societies are well capable of examining specimens brought before them under the microscope. I should, therefore, suggest that some of the societies would affiliate gentlemen like myself, who reside away from any photographic centre, as *corresponding members*. We might send specimens and papers to the societies, and the general interests of photography would be furthered. No one knows better than dry plate manufacturers that at least nine out of ten of those who use commercial dry plates know little or nothing of photography, either wet or dry, and that, therefore, the vendors of the plates can send any rubbish they have in the way of plates, knowing the workers do not know a good plate from a bad one, or whether the faults lay in the plates or in the development of them.

For myself I have, during the past five or six years, exposed and developed some hundreds of dry plates (chiefly commercial) by the Liverpool, uranium gelatine, and Russell, modes of preparation, and my boxes are full of negatives and transparencies on these plates, and those prepared by myself from emulsions. I claim, therefore, full acquaintance with the various modes of working these very different plates, and shall be happy to show them to any gentleman interested in dry plate work who may come to Bedford. You have spoken well in the NEWS of some of the nearly instantaneous pictures of animals exhibited by me from these plates in the Photographic Exhibition. In your YEAR-BOOK for 1876 there is an article of mine, "Commercial Dry Plates and their Value," and directly that appeared I received a letter from one of the gentlemen whose plates I alluded to, acknowledging fully the justice of my remarks, but stating that many of those who might read my paper would not, probably, comprehend their full meaning. I shall further state that some four years since I wrote a letter to your journal describing and criticising some plates sent me by Colonel Wortley. The gallant gentleman did not quite relish my description of his plates, and wrote me he would reply in the NEWS. I waited some weeks in vain, and on asking Colonel Wortley why he did not reply to my letter, he wrote me that if he did so he should have

to allude to the number of bad plates sent out by "another company," which would not have been prudent. I have the letters from both of these gentlemen, and they both fully bear out my testimony as to the badness of plates at times sent out by those who manufacture them.

As regards my own experience in photographic work in general, as "A Manufacturer" seems to hint that inexperience may be the cause of failure, I may state that I have worked at photography now for nine years, both at wet and dry work; that I have spent some hundreds of pounds on photography; and that rarely a day has passed during these nine years in which I have not done some photographic work in a well-appointed studio, and have had the advantage of the advice and companionship of such men as Messrs. R. M. Gordon, Blanchard, Rejlander, and others.

For the past eight or nine years I have read your valuable weekly journal with attention and interest. In an excellent article entitled "The Camera as a Plaything, and the Camera as a Scientific Instrument," you describe well the people who look on that instrument from each point of view. For myself, I can only say that photography has been to me a labour truly, but a labour of love, in which time and money have been ungrudgingly spent, and I cannot be content to look upon an art I love so much, and respect so greatly, merely from a commercial point of view. Some of the manufacturers of dry plates I know to be gentlemen who take a pride in perfecting their several processes, but there are others who care little for the goodness of their dry plates, provided they can get rid of them for a high price.

Dry plates may be looked on in photography as cartridges for breech-loaders are by the sportsman: when good they are of the highest value; when bad they are worse than useless.

FRANCIS W. TUTOR.

Proceedings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

ON Thursday, July 5th, the members of the Board of Management held their monthly meeting at 17½, Fleet Street, and transacted the following business.

The minutes of the previous meeting having been read and confirmed, Mr. Ehlers was elected an ordinary member of the Association.

The half-yearly balance sheet was then placed before the meeting. After being carefully examined, it was adopted unanimously.

Various estimates for printing the new edition of rules were then considered; the selection of one having been made, the Secretary was instructed to expedite the issue.

A motion was brought forward "That any member of the Board of Management not having attended six monthly meetings of the said Board in the course of the year, dating from the time of election, shall not be eligible for re-election." After some discussion on the subject, it was proposed by Mr. Lavender, seconded by Mr. Attwood, and carried.

Grants for various purposes having been issued, the meeting adjourned till August 2nd.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE members and friends of the above Society held their second monthly excursion on the 6th inst. to Milner Field, the seat of Titus Salt, Esq. Most of the party arrived by the 1.50 p.m. train at Saltair Station, whence they proceeded to Saltair Park, where it was proposed to wait till the remainder of the party arrived. A few pretty views were taken of Saltair from here. The park appeared to please the members very much, but the other members appearing at this time, it was decided to lose no time in making for Milner Field, where, through the kindness of Mr. Titus Salt, the party were allowed to look through the grounds and conservatory, and through his splendid greenhouses, where he grows a large quantity of vines. Afterwards they proceeded to Shipley Glen, a romantic and very popular little place.

After enjoying themselves on the Glen for an hour or so they began to think that tea would be very acceptable, so set off for Shipley, where a substantial knife and fork tea was provided.

After tea there were playing and singing and a little dancing. The party were compelled to break up rather early, on account of catching the train. All agreed that they had had a very pleasant holiday. It is proposed to go to Temple Newsum on the 1st of next month.

Talk in the Studio.

COPYING AT NIGHT.—Mr. T. C. Harris writes in the *Practical Photographer*:—"I have been in the habit of making copies of photographs or other pictures at night, when busily engaged during the day. This is how I do it: Place the camera and picture to be copied in the proper position, and when ready to expose, hold a kerosene lamp near the picture, in such a way that the light will fall on the picture in the same direction that it fell on the subject when the original picture was taken. Now place behind the lamp a silvered glass reflector, so as to concentrate the light on the card, and while exposing, keep the reflector in motion, so that the picture will be equally lighted all over. Expose three or four times longer than in daylight, and use the developer double strength, or vary the time to suit each case. By this means I have made as good copies at night as in daylight. The lamp should have an Argand burner, and the reflector should be a glass one, such as is used on bracket lamps."

TO SENSITIZE TISSUE IN HOT WEATHER.—I place the tray in a tray of cold well water, just pumped, and find it reduces the temperature to about 50°. I also have a large plate glass lying in water of the same temperature. I then immerse the tissue in the sensitizer, and when it curls the opposite way I place it face down on the glass, from which the water has been thoroughly removed with a squeegee used only for that purpose. Cover the tissue with rubber cloth and squeegee thoroughly; then apply a blotter to the back to remove all drops of sensitizer, and lift immediately from glass and hang in the dark. All the above I do in a well-lighted room where I can see what I am about. I can then hang it up and fear nothing even when the mercury shows a temperature of 95° anywhere in my rooms. There is no need of cooling the glass after the first time, but sensitize all you wish at that time; it won't stick.—Dr. WITT C. ROOZE.

A WORD OF CAUTION TO CARBON PRINTERS.—A great many photographers may not be aware of the very poisonous properties of the salts of bichromate of potassium or ammonium, now used so much in carbon printing, photo-engraving, &c. We would, therefore, like to call their attention to an article published in a late number of Dr. Hornig's "Photographic Correspondence," in which he says that these salts are to be dreaded and handled as carefully as arsenic or bichloride of mercury. The effect of this poison, when taken internally, was an inflammation of the mucous membrane of the mouth and throat, with cramps in the stomach. The hands and feet would turn cold, become paralyzed, and finally death would ensue. In case of poisoning, send immediately for a doctor; in the meantime, give to the patient milk and the whites of some eggs, and try to keep the extremities warm by rubbing them with alcohol and a little aqua-ammonia. It seems that some persons are more prone to be affected by this poison than others. Be careful to wash your hands well after having had them in a solution of the bichromates, and avoid contact altogether when the skin on your hands or fingers is any way abraded or sore. The pustules caused by this poison are very difficult to heal, and our carbon readers, we hope, will take warning by what we have just said.—*Practical Photographer*.

To Correspondents.

G. F. R.—The chief defect in your card is simply the result of using an unsuitable lens. The image is only illuminated in the middle, and the definition is only approximately perfect in the middle of the plate. You have, apparently, a very bad quarter-plate lens, which is quite unsuitable for standing figures in card portraiture. You must get a lens suitable for the work. This one may be improved by using a small stop, but the exposure will be much longer. What you require is a lens made for producing card portraits.

HOPKINS ARTIST.—In order to print an enlarged image direct on albumenized paper, you would require a solar camera with very large and powerful condenser; and the exposure with continuous sunlight would be from one to three hours. There is no method of enlarging so effective and so easy as that of making an enlarged negative and printing from it. You may produce an enlargement on paper by a few minutes' exposure in a solar camera if you employ iodized paper and develop the image, but the trouble is very little less than that of producing an enlarged negative, and the result not nearly so good. Your former letter, to which you refer as not receiving answer, never reached us.

C. NORMAN.—We have not heard whether space has yet been awarded to photographers in the Paris Exhibition of 1878, but we think not. See a short leader on the subject.

SINCERITY.—We think your love for photography, and your honest desire to improve, are fair bases for success, and we should advise you to persevere. Do not be discouraged because you were brought up to another business. Almost all the men whose names are distinguished in photography were brought up to other trades, and they adopted photography and succeeded in it from love of the art. You have, of course, much to learn. Study art whenever you have opportunity. Read all the works on elementary art you can meet with, and try to understand them and to digest and assimilate the information they contain. Study good pictures whenever you can, and try to understand in what their excellence consists. Keep on practising photography whenever you have opportunity. Do not be in a hurry to give up your own business until a favourable opportunity occurs. And then, when that happens, you will be able to accept it with increased fitness from continued culture. Your work is very promising.

DILKAMA.—The chief of the markings in your negative are, we think, from the use of turbid collodion, the residue at the bottom of a bottle having been apparently disturbed and mixed up with the bulk of the collodion. The comet-like markings with a nucleus or head, and long, curved tail, suggest a defect common in simply iodized collodion; to cure which the addition of about one grain per ounce of bromide of cadmium might be used. There are a few pinholes proper, which may arise from the bath; if they are caused by sulphate of silver, the addition of nitrate of baryta, say three grains to each ounce of nitrate solution, may prove a cure. The addition of distilled water to an over-iodized bath will, of course, make it turbid, and, unless the iodide of silver thus precipitated be carefully removed by filtration, the pinholes will be worse than ever. We see no reason to suppose that the defect was in any way due to the distilled water.

EDWIN L. PENNY.—We do not know of any special portable camera used by the war artists in the East. There are many which may be used, which you will see announced in our advertising columns; but we are not aware that any special form is used in preference to others.

D. K. M.—You will find many articles on the coffee process in our last volume, and you will find it succinctly described in our last YEAR-BOOK.

H. J. JEN. wishes to know what process goes on when a plate coated with collodion is immersed in the nitrate of silver bath. He "presumes" that the object is to allow the film to absorb some of the silver solution. The process is not quite so simple as our correspondent "presumes" it to be. The collodion with which the plate is coated contains iodide and bromide, probably of potassium. Iodine and bromine have great affinity for silver, and silver has an affinity for them; hence, when they are placed in a solution containing a salt of silver, a combination takes place. A process called double decomposition enables this combination to be made; the silver leaves the nitric acid to which it was joined in nitrate of silver, and joining the iodide and bromide forms iodide and bromide of silver, and the nitric acid set at liberty joins the potassium which has been left by the iodide and bromide, and forms nitrate of potash, some of which remains in the film, and the remainder passes into the bath. The iodide and bromide of silver formed constitute the salts which are sensitive to light. In the emulsion process the sensitive salts of silver are held in suspension in the collodion.

HOPKINS.—The tone is excellent, and the prints very good. No. 3 is too deeply printed, however.

G. G.—Your discoloured whites in the copy of the engraving arise from the fact that your negative is not sufficiently intense; and the light prints through the opaque parts of your negative before the blacks are sufficiently deeply printed.

AMATEUR MECHANIC.—A good dipper may be made in various ways. Silver wire answers well. A piece of plane tree or poplar cut to the right shape, and well saturated with paraffin or wax, answers. We generally take a strip of stout plate glass, and cement on it a shoulder, on which to rest the plate, with marine glue. It is wise to place the shoulder an inch or two from the bottom of the strip, so as to keep the plate away from the sediment of the bath.

J. GREER.—Thanks. In our next, several Correspondents in our next.

The Photographic News, July 20, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE JURORS AT THE NEXT PHOTOGRAPHIC EXHIBITION—THE LATE O. G. REJLANDER—HOT AND COLD DARK ROOMS—PHOTOGRAPHY BY MEANS OF LIGHTNING.

The Jurors at the Next Photographic Exhibition.—We are glad to hear that the Council of the Photographic Society have induced two Royal Academicians to act as jurors at the next Exhibition of the Society in October. One of them, moreover, occupies the distinguished post of President of the Society of Painters in Water-colours, so that every one must perforce feel satisfied with a verdict recorded by a body of which two artists of such high reputation form part. Mr. E. W. Cooke, R.A., and Sir John Gilbert, R.A., are the names which will be found included in the list of jurors, the other gentlemen being the President of the Society (James Glaisher, F.R.S.), one Vice-president (Captain Abney, R.E., F.R.S.), one other member of the Council (Mr. T. S. Davis), and two members of the Society (Mr. Faulkner and Mr. Piercy). Such a list of names ought to give satisfaction. Mr. Cooke, R.A., who paints with almost photographic exactness, is particularly competent as an artist to judge photographers, and the jury includes men also who are so thoroughly conversant with the science and technics of photography as to know what belongs to it, and what does not. Altogether, there is every reason to hope for a good exhibition this year, and we sincerely wish that it will be of such a nature that only good things need be hung, and that the walls will not be filled with common-place pictures as well as deserving works, for the reason that something must be done to cover them.

The late O. G. Rejlander.—It is gratifying to learn that the grave of O. G. Rejlander, at Kensal Green, is no longer to remain without a monument. We are aware that the placing of a gravestone over the resting-place of this talented artist has for some time past been contemplated, and several gentlemen we know expressed their willingness at the time of Mr. Rejlander's death to join hands with this object in view. Fortunately the initiative has now been taken in a very energetic manner, and before the summer is gone a suitable stone with a medallion of the deceased will have been placed in Kensal Green. Mr. Theophilus Smith, to whom photographers owe the first step in the matter, is a sculptor whose works are known at the Royal Academy, as well as at Sheffield, where he has executed several busts of local celebrities. Mr. T. Smith had already finished his clay model of Rejlander, and as he has done his work with the skill of an artist and the love of a friend, we may safely rely upon the result being a satisfactory one. Mr. Smith not only gives his labour, and makes a present of the bronze casting, but provides a well-wrought stone to receive the medallion, which will be consigned to Kensal Green from Sheffield ready lettered and in a fit condition to be at once set up. To render the work more complete, however, it is suggested that a coping-stone or neat railing should enclose the grave, and this, together with the fixing of the headstone, will entail some small expense, towards which many will no doubt be pleased to contribute. It would be pleasurable to see a large number of photographers upon the subscription list, each subscribing a small donation, rather than that the amount should come out of the pockets of a few of the late Mr. Rejlander's friends and acquaintances. There are many who have benefited by his precepts and his works, and these would do well to aid in setting up a monument to the clever artist who has so recently left us, and whose name must long remain a household word among those who strive to infuse art into their photographic work.

Hot and Cold Dark Rooms.—Summer is *par excellence* the season for dry plates and for emulsion work. The difficulties attendant upon the nitrate bath, the keeping moist of the collodion film, and maintaining solutions cool, are of such a nature as to make one renounce wet plate photography in bright sunny weather. At the same time there are magnificent wet plate pictures to be secured in the intervals of cloud and sunshine which we have lately experienced, if only the laboratory and solutions can be kept not only cool, but cold. On a recent occasion we had an opportunity of seeing some negatives taken which had been prepared and developed in a cellar, the exposure-taking place in a well-lit landscape. The clichés were of a degree of brightness and clearness seldom seen. Not a stain or pinhole was visible, while the gradations were delicate and fine throughout. The whole batch of negatives were good throughout, and although the bath had been giving trouble previously, a sojourn of twenty-four hours underground caused it to do its work faultlessly. And this result set us thinking whether in large establishments it would not pay to employ underground laboratories and dark rooms in summer time, the plates being sent up to the studio by a carefully constructed lift as required. Such an arrangement would be not only profitable, but pleasurable. To endeavour to secure good portraits in some of our studios in the dog days is heart-breaking work, and in dark rooms that adjoin the glass room, and have the sun pouring down upon them all day long, we wonder that negatives can be taken at all, at any rate free from stains and drying-marks. At one studio, in Paris, which we visited in summer, we once observed a negro-operator, working away in a smoking dark room in his shirt and trowsers, and we consoled ourselves with the idea that he was probably better fitted to bear the stiflingly hot temperature than an European. Since then the reminiscence has often come to our mind when cooped up in a dark cabin in hot weather. How to keep cool is, indeed, the main problem for the photographer in hot weather, and he is often sadly taxed to bring down the temperature. His dark room is, however, as a general rule, right under the roof, and from the fact that the slightest crevice will let in a vivid daylight, it is necessary that every crack and fissure should be stopped up. In these roof dark rooms ice melts like sugar in a cup of tea, and I have seen photographers in their despair swaddle the collodion bottle in flannel, and drench the latter with costly alcohol or ether to keep down the temperature by rapid evaporation. Could not our studios manage to have a studio below stairs, and if a lift is impracticable, then, perhaps, a portable cold cupboard, capable of carrying half a dozen dark slides to and fro, might serve the purpose. There is nothing like this summer weather to secure clear and delicate pictures, but then plates, bath, and developers must be cool. A sheet of glass, when perfectly cold and dipped into cold solutions, will remain a long time before it grows warm again; but if a plate is warm to begin with, and the collodion and bath are not cold, the film dries very rapidly. There is no such photographic weather as that which we are at present enjoying, but it needs to be taken an advantage of, and made proper use of.

Photographing by Means of Lightning.—Mr. Jarman's experiments with lightning as a means of illumination are exceedingly interesting, and should not be passed over without notice. He managed to take a view of Queen Street, Ramsgate, being lighted, as it was, by twenty flashes one after another. No doubt the illuminative power of a bright flash is very intense, and if he could have made choice it is possible Mr. Jarman might have secured a picture with less than half this number of flashes. A single flash, he tells us, was sufficient to print a negative by contact upon another film of collodion, a fact we can readily believe, since a quickly revolving wheel has been ere now depicted in the camera by the aid of a single electric flash.

LIGHTS AND SHADOWS IN A PICTURE:

THEIR USE AND VALUE, WITH OTHER SUGGESTIONS, FOR ART-STUDENTS.

BY MARCUS A. ROOT.

ALTHOUGH persons ignorant of artistic effect may find fault with the most effectively disposed lights and shadows, I would earnestly counsel every photographer to study and give to his productions the highest possible artistic value. This he should do not alone for his own reputation, but for the honour of his art and its professors. If insensible to these motives, he may well doubt his possession of the qualities indispensable to his profession. At all events, a skilful, delicate use of lights and shadows is essential to the production of those heads truthfully modelled and well "rounded up," which can win for their author the proud name of artist.

In nature the intensest lights and darkest shadows are always sparingly employed, and this invariably in points, and never in masses. If the light be in a large mass, it is subdued; and the shadow, if broad, is feeble. The interval between such contrasted light and shadow is occupied by middle tints and pale greys. Into this scene nature introduces here and there a spot of high light, and here and there one of intense gloom; the effect of which is to vivify the whole. Her invariable rule, then, would seem to be to furnish the same amount of deepest shadow as of intensest light, and neither more nor less—points of each answering to those of the other, and both showing vividly out from the rest of the landscape. Such is nature's method of managing light and shadow; and herein the artist has a model which he should strive, to the extent of his ability, to copy.

Masses of diffused, soft light, balanced by masses of expanded mild shadow; the space betwixt the two filled by carefully graduated middle tints; while here and there a keen, bright spot of light is set off by equivalent spots of deep shadow. Here is the programme which the wielders of the pencil and the camera should alike endeavour to conform to, and the nearer they approach it the more do they exhibit the genius and executive skill of the artist.

These principles, we were pleased to find, had been seemingly vigorously observed and carried out, too, by several of the leading landscape and portrait artists, both foreign and American, whose grand, and we may say marvellous, productions attracted so much attention while on exhibition in our International Centennial Exposition, 1876.

It is impossible, on paper, to tell the Photo-Artist—the new beginner—how he can make his own simple instrument execute a work so complex and delicate. But if he have the eye of genius, there will need but industry and perseverance in observing and experimenting to discover the *modus operandi*; besides that, he may be essentially aided by an accomplished artist—if out-door or landscape art is his study—to point out the most favourable spot from which to take his view, select and fix the hour of the day for artistic effect of light and shadow, and direct his attention to the needful accessories, a rock, tree, stump, clump of brushes, weeds, &c., or the want of these, in the foreground, and to the proper handling of the camera, both in the field and in the studio, before the eyes of the novice in art. An art-student of nature, with the above aid, will readily perceive that what we call "relief" (i.e., the apparent standing out of the object from its ground) is effected by the contrasting of light and shadow. So, would you produce breadth and splendour of effect, join together masses of light objects and corresponding masses of dark objects. Again, to get harmony and softness, sink some objects partially or wholly in shadow, and let their outlines be insensibly lost in the ground. Finally, to create vivacity and spirit, make, in some parts of the picture, abrupt breaks and sharp transitions.

In portraiture, let your shadows fall at the proper angle

on the face, be decided, pure, transparent, and effective. The lights and shadows on the face or other parts of the picture must be managed with the greatest care, in order to produce rotundity, relief, harmony, and life-like effect. When the broad or short side of the face is mostly in shadow, the shaded cheek should, if possible, be tipped with light, to give it a pleasing fullness and natural-seeming roundness. The model (sitter) should be so placed under the light in the studio as to project short shadows, the light being sufficiently subdued to preserve the half-tints, while the time of exposure is long enough simply to develop or secure the image completely, without meanwhile "overdoing" (i.e., solarizing) or flattening the picture. So, too, all strong cross lights and reflections should be carefully avoided, and special pains taken to impart the utmost rotundity, boldness, and force, to all portions of the figure. As a faithful likeness is the chief desideratum in portraiture, the mere head and bust are preferable to a larger proportion of the figure. In some it should, if practicable, when more than the head is taken, indicate the breadth across the shoulders with the relative size of the body, when the portrait is set in an oval frame or case. Artists generally prefer painting short shadows on the narrow side of the face, in a two thirds or a three-fourths view. Occasionally we encounter an admirer of Rembrandt's or Vandyke's manner, wherein the shadows are so broad and strong as to shade deeply nearly half the face. Unfortunately, however, for the photo-artist, many, if not most, of his patrons, like England's "Queen Bess," prefer "pictures without any shadow at all!" If you would give to a spare, thin face, with high cheek-bones and deep wrinkles, a fuller, younger, and more attractive appearance, you must reverse the general rule. Thus, to impart to the face and head the utmost possible boldness, energy, rotundity, &c., place the subject (sitter) so that in a two-thirds or three-fourths view of the face the face may, from the point of sight, or eye, or the part focussed upon, be almost totally in shadow or so that the shadow may fall from the cheekbone backwards towards the ear. By this means, with a clear, distinct shadow on the side of the nose and face, and a soft, mellow light along the cheek, a picture is obtained upon a flat surface which, wondrously "relieved" from its background, exhibits all the roundness and solidity of nature. The artist who is fully alive to all the requirements of his profession will find that nearly every successive subject needs a different arrangement of light and shadow, with a different location in the studio view of the face, &c. Accordingly, his genius (for nothing else can) will suggest such a change in the position of the camera, in the position of the background, and in all other conditions, as is required for the object aimed at. And, as the reputation alike of himself and his establishment must rest on the artistic merits of his productions, so every successive picture is a proof, patent to all capable judges, either for or against his pretension to the title of artist.—*St. Louis Practical Photographer.*

HOW TO CLEAN DAGUERREOTYPES.

[A CORRESPONDENT of the *St. Louis Practical Photographer* sends to that journal a thoroughly practical article on cleaning Daguerreotypes, a process but little understood by modern photographers. We can endorse the instructions, having many times proceeded similarly with success. We recommend using distilled water solely.—Ed]

To clean Daguerreotypes perfectly; so many ways have been published, so many Daguerreotypes have been spoiled beyond redemption, by so many ways being tried, by so many who did not understand cleaning them. If the photographer, or even the old Daguerreotypist, follows the following instructions closely he never will injure one, and clean it perfectly, so that it will be as brilliant as the day it was taken, if it has not been defaced by rubbing the surface of it. First, all films, spots, and chemical action can be

removed by the following method, and by no other that I have seen published or heard of. Now bear in mind, the secret is hot water; where it should be used I will state. Second, when a party brings a Daguerreotype to you to copy, or restore, as they call it, if there are no defects on it, carefully take it apart, brush the surface with a fine camel's-hair brush crossways the position of the picture, never up and down; then copy it. Third, if there is a film of some or all colours of the rainbow, spots or stains on it, have ready some hot water, cyanide, a pair of pliers, spirit-lamp, and some distilled water. Next, proceed as follows: First, see that the water is filtered and clean, cyanide also; brush as directed above; then take hold of your plate with the pliers, pour on the hot water first, leaving it on the plate for about a minute, more or less; that softens the film of imperfections that is on the Daguerreotype plate or picture. The hot water is the whole secret of cleaning, with the other things mentioned. Cold water may do, and may not, as I have often found out, but hot certainly will. Next, pour the hot water off, and pour on the cyanide solution, and it will immediately eat off all imperfections; then wash the picture, and it will become as brilliant as when it was first taken. As soon as the imperfections disappear, which will be in a few seconds, pour off the cyanide solution, and rinse the plate well with distilled water; lime-water would spoil the picture, rain or soft water might do; then, with your spirit-lamp in one hand and your pliers holding the plate in the other hand, commence heating the plate from the upper corners, and blow gently with your breath on the plate till it is perfectly dry; do not stop blowing till it is so, for it is liable to leave a stain where you would stop off blowing and commence again. After this, seal up the picture well with sticking paper, leaving no breaks in it to let in air on to the picture, for that is what causes the defects on the plate, the action of the atmosphere on the gold surface that is over every good Daguerreotype picture. Now, you will have as perfect a picture as the day it was taken. For such jobs we get from one to five dollars, according to the condition and size of the picture. I was once offered fifty dollars to restore a fine and valuable Daguerreotype that seemed as if it was entirely obliterated; I took my five dollars, and was satisfied. Although we have published how to clean Daguerreotypes before, letters come in asking us to give them our process, if it is not secret.

THE FERROTYPE.*

It is astonishing what a multiplicity of names the positive picture goes by. Some will call into your gallery and call for some gems; others want ferrotypes, bon-tons; another party wants anotypes; but the majority want tintypes, and open wide their eyes and mouth with astonishment when you tell them they are one and the same picture. Call them by what name you may, they are very pretty pictures when well taken, especially when you put them in cases and seal them up. Photographers who do not take plate pictures, as we shall call them, have no idea of the extent to which that branch of the business is carried, especially in the country. We have no doubt but what there are two artists in this line of the business to one in photography. As a general rule they are cheap pictures, and the business is easily acquired, which no doubt is the cause of so many practising it. Of late years it has become quite fashionable to go tenting it through the country. It is a very pleasant way to spend the summer, and there are not millions in it, but there is money in it when you understand the business and start out right.

We give below a very good formula for plate pictures, one that can be relied upon, all other things being favourable; but the great trouble in all processes and formulas is not having all things right—one in harmony and keeping with the other. We will cite one instance

* St. Louis Practical Photographer.

here. Your collodion is right; your bath is right; your time and developer are right; you work all right for a few days, then all goes wrong. Your opponent does the same, but he is still all right. You wonder what is the matter. To test the thing, you coat your plate, and dip it in his bath, you using all your own chemicals otherwise, and it comes out all right. You wonder. Your friend tries the same dodge in your bath, and all works wrong. Now the cause is, you have a bath that holds, we will say, a pint, and his holds a quart. Yours gets out of order first. It wants more solution—in fact, the bath is entirely too small to work to advantage. No gallery should trust to one bath. Always have two for plate pictures and two for negatives, and half of your troubles will be over. A bath should never hold less than a quart, up to two gallons. The inventor of small baths should be voted a nuisance, who is dangerous to the photographic fraternity. In preparing your bath for plate pictures, if you expect to get fine effects with that style of picture, it can be done by being particular in all things, especially your bath. Take any quantity of distilled or soft water and dissolve it into thirty-five grains of silver to the ounce, and if you are careless or too lazy to make some iodide of silver to sensitize it with, why coat the largest plate you can get in your bath with collodion, and dip it in the bath and let it remain till morning; then take it out, coat a plate, and you will find it will work all right; but after you mix your silver and water, test for acid, and if it is not acid, put in about twenty drops to the quart; test with litmus paper, and if it is pretty red it will work well. It should be much more acid than the negative bath to make brilliant results. If you wish to make your own collodion, here is a very good and reliable formula.

Collodion.

Iodide of ammonium	...	5	grains to the ounce
Bromide of potassium	...	2½	grains to the ounce
Ether and alcohol	...		equal parts.
Cotton	...	5	grains to the ounce.
Bath, 35 grains strong to the ounce.			

Developer.

Water	...	16	ounces
Proto-sulphate of iron	...	1	ounce
Acetic No. 8	...	1	"
Alcohol	...	1½	"

Fix in strong solution of cyanide of potassium. In mixing your collodion, dissolve your bromide of potassium in water enough to dissolve it.

Mix your collodion in the following order:—Alcohol and cotton, shake well up; ether next, shake till dissolved; then your iodide; then pour off a couple of ounces of your collodion on to your bromide solution, and it will take it up better; then pour it back into the balance of your collodion; let it settle after well shaking, and it is ready for use the next day, when it grows better and better the longer it is made; its keeping quality for about three months is first rate, then it will work slower; but if you have any business at all, you can work up the quantity you make in that time. The best plan is to make up small quantities, say about sixteen ounces at a time.

THE USE OF THE DIAPHRAGM.*

WHETHER it was necessary to go to the Greek for a word to be used in a business like ours, which does not require a classical education, is a question we will not at present discuss; suffice it to say the word diaphragm is from the Greek, and means a partition or division. In photographic instruments it is hardly appropriate; to be literally correct, it should have been "a cutter off," "a hinderer," for which a shorter word could have been found in the same language.†

Some time ago an old photographer, in our hearing, boasted that he could put a patch as large as a dime right

† Nothing is better than the common term "stop"—*En. Photo. News.*

in the centre of his lens, and make a good negative—better than without it—and he claimed something extraordinary for his lens on this account. At first this appeared like idle boasting, but it was literally true. We were so puzzled that our coming grey hairs got to rubbing against each other, and, by-and-bye, a solution of the problem was ground out. For the benefit of our young readers, we give it as briefly as possible.

A photographic camera tube for portraiture is composed of four lenses, mounted in pairs—a pair in front hermetically sealed together, and a pair behind fitted to each other, but separated by a ring differing in thickness according to the size of the lens and the curvature adopted by the maker. Between these pairs of lenses the diaphragm is placed.

Few photographers study the philosophy of either the process they practise or the instruments they use. Chromatic aberration and spherical aberration are terms they know in the books and journals, but beyond this their knowledge does not extend; and if, by chance, one posted a little better happens to mention such a term, he is at once set down as "hifalutin" and anxious to show off in the style of the coloured missionary who but yesterday was a wood-sawyer.

Now, to render the subject intelligible, we will illustrate by an exaggeration. We will suppose a photographic lens to be four inches diameter, and ten inches focus, with a spherical aberration of one inch. Now, as the aberration increases towards the edge of the lens, it is evident that if we cut half an inch all around, leaving an aperture of three inches, we have got rid of more than one-fourth of the aberration; but for the sake of simplifying we will suppose it to be one-fourth, and divide the lens into four divisions, which we will number 1, 2, 3, 4. Number 1 is the central inch, a circle of one inch in diameter. Number 2 is a ring half an inch wide and two in diameter. Number 3 is a ring half an inch wide and three inches in diameter. Number 4 the outer half inch of the lens. The aberration we will also divide into fourths, and number 1, 2, 3, 4. Number 1 will represent that portion belonging to number 1 division of the lens, and situated from ten and a quarter to ten and a half inches from the lens. Number 2 will be immediately in front of Number 1, by which we mean nearer the lens, and will extend from ten to ten and a quarter inches. Number 3, following Number 2, will occupy from nine and three-fourths to ten inches; while Number 4, being nearest the lens, will extend from nine and a half to nine and three-fourths. The open lens being ten inches focus, it will thus appear that the longest division, or Number 1, including only the central rays which pass nearly straight through, extends half an inch beyond the common focus; while Number 4, which includes only the outer rim of the lens, falls short by half an inch, as before stated. This is not absolutely correct, and is used merely as an illustration to explain what would be very difficult to explain accurately even by the aid of diagrams, and is utterly impossible without them. Of course, every photographer knows that each atom of surface on his lens transmits a picture of whatever is before it, and the aggregation of these atomic pictures forms the picture seen on the focussing glass of his camera. He also knows that the aberration referred to, and which requires the diaphragm to correct it, is caused by the light rays striking the curved surface of his lens at different angles, increasing toward the edge, and that the greater the angle the greater the refraction. In the case we have supposed, for illustration, the difference is set down at one inch. Now, let us suppose our old photo. to have used the four-inch lens we are speaking of, and to have covered up the central inch; he then had divisions 2, 3, and 4, with a spherical aberration reduced from one to three-fourths of an inch. The lens would work slower but sharper, and he would get a better picture than without the patch; increase the size to two inches, and the aberration, being reduced to half an inch, there would be a further gain in sharpness, but a loss of light, and, of course, the lens would work

more.

A writer in the *Mosaic* touched on this question, and asserted that a disc perforated with holes answered almost the same purpose as a diaphragm, and he was puzzled thereby, and well he might be; a disc perforated as his was, would certainly reduce the speed, but it would not in any way affect the spherical aberration, inasmuch as the centre of the lens and parts of the outer division being exposed, the aberration would be the same; but, as parts of the lens were covered up, a proportionate loss of light and speed would be the result, without in any way affecting the aberration. Now, as it is to get rid of the blurring and lack of sharpness that the open lens necessarily gives that a diaphragm is used, it is evident that by reducing the aperture of the diaphragm the aberration on the basis of our supposed case is proportionately reduced; but in actual practice it will be found that the proportion of aberration cut off is much greater at the edge of the lens than nearer the centre; consequently a diaphragm covering divisions 4 and 3 will cut off much more than half the spherical aberration, and, as the use of very small diaphragms in portraiture is attained with such a loss of light as to render them inexpedient, they are very seldom used. It might be asked, if it is true that a patch in the centre will answer the purpose of a diaphragm, why not use it? We reply, it does not answer the same purpose, as the rays passing through the centre of the lens are less refracted, and consequently yield a better picture; but as some old photos. like occasionally to puzzle their younger brethren, we have tried to show why a patch on the middle of the lens does not prevent its making a picture, as some parties think it would. We have heard a person assert that a patch on the centre of the lens would give a picture with a hole in the middle of it, and argue long and earnestly to sustain his assertion.

The position of the diaphragm is also a thing to be considered; the front lens catches rays reflected from the object, and transmits them in converging lines to the rear lens, which, catching them converging, increases the convergence by a second refraction; the placing of the diaphragm between the front and rear lenses of the portrait combination cuts off the outer rays of the front lens, and shuts off the outer part of the rear lens. A disc in front of the front lens the same size as the diaphragm placed between the lenses reduces the speed of the instrument much more, while the diaphragm between gives the better picture; the reason of this we may take up at a future time—our present object is merely to show why a diaphragm is needed; why a patch on the front lens does not prevent it making a picture; and why a perforated disc does not either prevent the lens from making a picture, nor act the part of a diaphragm.

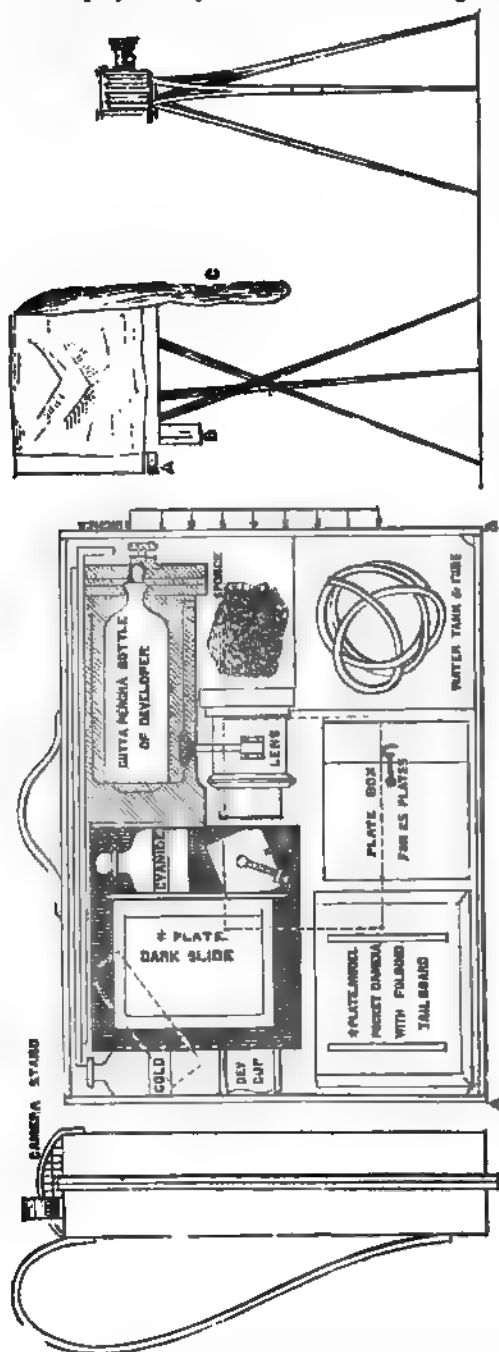
PORTABLE PHOTOGRAPHIC APPARATUS.

BY A. TROTTER.*

Now that the photographic season is approaching, I think a description of the tent I took to Switzerland with me last year may be of some use to intending photographers. I decided to use the ordinary wet plate process. After inspecting most of the tents made by the best makers, as none suited me, I contrived a combination of their best points. I had made a box consisting of two trays hinged to one another at one side—it measures about three-and-a-half by eighteen by thirteen inches when closed. I have only a sketch of it by me, and have calculated it from it. This sketch almost explains itself as to the packing. The dark side, cyanide bottle, and some screws for fixing the camera and tent are put into a glass dish, which was the heaviest part of the concern. This is shaded in the sketch, as also is the ebonite bath. This latter was dropped into a hole represented by the dotted lines in the corner, and hung by the ledge round the top. This hole is closed by a shutter when travelling. The other dotted lines show the position of a window of yellow glass at the bottom of the tent. A pocket handkerchief or a piece of paper being put on the ground below the negative may be watched

* *English Mechanic.*

during development while in a horizontal position. The glass window can be lifted up when the plate is being washed. This also is projected by a shutter when travelling.



At the top of the box in the sketch are three brass tubes, two of which have angles soldered to them. When fitted together they form three sides of an oblong, nearly the same size as the box. The two free ends are placed in sockets at the corners, A and B. The box is hinged on the side to which the leather handle is fixed, and when in use as a tent the two trays of which it is composed are fixed open at right angles, a cover of black and yellow cotton is thrown over the rods and all, and secured round ledges fixed to the edges of the tray by an elastic band. This is not a very safe method, but I never had an accident from its becoming unfastened.

The tent was fixed upon a folding tripod, something like a large campstool, while the camera stood on the stand supplied with it, the legs of which had been divided half way down, and fitted with ferrules. These legs were strapped on to the box outside when travelling. The tent stand is supposed to be used as an alpenstock, but is not strong enough. A better one might be contrived. The tent stands about four feet from the ground.

The water-tank is fastened to the upper tray, and when in use is in the upper right-hand far corner of the tent. In packing up, the lower tray is arranged as in the sketch, and the cover is wrapped up and laid over all. I found it difficult to carry water in the tank, and it only holds enough for two plates, so I had to refill it every time, which was inconvenient, especially at the top of a glacier.

The developer (ammonio-sulphate) was not injured by the gutta-percha bottle. I emptied what remained each day into a stock bottle, and refilled it just before starting. I did the same to the bath in which the dipper is always kept. The whole affair weighed about eleven pounds, not including the glass dish. This was used for washing into and developing over, but the window could have ledges fastened to it to serve as a dish. I had thought of this when the tent was being made, but did not know the dish would be so heavy, or I should have had it made so.

The other sketches represent a side view of the tent when closed, showing the shoulder-straps for carrying on the back, and the tent open for use—A being the handle, B the bath, C the loose hood going over the operator's head and arms, and coming down to his waist. I shall be glad to make anything clearer, and shall value suggestions, especially from Mr. Lancaster, who made the tent, and knows more about the model pocket camera than most people.

COLLODIO-CHLORIDE.

BY MERCER.

PREPARE two collodions as follows:—

Collodion No. 1.

Alcohol	...	...	...	2 ounces
Ether	...	...	...	3 "

Negative gun-cotton (Anthony's) 00 grains.

Put the cotton in a bottle, allow it to soak a few minutes, then add the alcohol, and shake till the cotton has all dissolved. Take one hundred and twenty grains of nitrate of silver, powder it very finely; put this in a small bottle with three ounces of alcohol; set this bottle in a dish of cold water, and heat up until the alcohol boils, and the silver is all dissolved. As soon as this is effected, pour the silver solution, while still hot, in the collodion given above, stirring all the time to secure a perfect solution.

Collodion No. 2.

Alcohol	...	...	...	4 ounces
Ether	...	...	...	4 "
Chloride of strontium	...	...	...	32 grains
Citric acid	...	...	...	24 "
Negative gun-cotton	...	...	...	00 "

Reduce the strontium and citric acid to a fine powder (together), and dissolve in the alcohol; add the ether and the gun-cotton afterward. If adding the ether produces a precipitate, filter it out (through paper) before adding the cotton.

These two collodions are to be kept separate until wanted for use; then mix in equal parts, adding No. 2 to No. 1.

White Varnish.

Gum sandarac (picked)	...	...	...	1 ounce
Alcohol	...	...	...	4 ounces
Chloroform	...	...	...	1 ounce
Balsam fir....	...	...	...	1 teaspoonful.

Mix, dissolve, and filter.

Use, slightly warming the plate; keep tightly corked when not in use; add, occasionally, chloroform, to make up for evaporation.—Practical Photographer.

The Photographic News.

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CLOUDS IN LANDSCAPES.

ONE of the most effective and pleasing revolutions which have characterized landscape photography of late years is the general introduction of clouds into the prints. The most perfect photographic landscape with a staring, hard, blank mass of white for the sky, killing all the lights in the foreground, and utterly destroying atmospheric effect, was an unsatisfactory affair. It was as untrue to nature as it is offensive in art. It is in the sky, as Ruskin observes, that nature has done more for pleasing man with beauty than in any other of her works. "There is not a moment of any day of our lives," he adds, "when nature is not producing in the sky scene after scene, picture after picture, glory after glory." Surely, it is one of the most important functions of photography—the art of truth, and which boasts itself in rendering recondite truths scarcely visible to the eye—to attempt to catch these fleeting beauties of nature, and give the crowning beauty to scenes from nature, by adding clouds to every presentment of a landscape. Happily, the importance of this kind of work has been recognized of late years, and a landscape with a blank white sky is now as rare as one with natural clouds was a dozen years ago.

We have recently received from Mr. A. Ford Smith, of Llandudno, some charming illustrations of the value of clouds in giving pictorial value to landscapes. They are all fine, but some, in which ranges of mountain form the extreme distance, are especially charming; the delicate floating clouds seem to take up the suggestion of space and distance indicated by the faint tender outlines of the hills, and carry the eye away into infinite space. This fitting selection of a sky, the lights and shadows of which shall harmonize with the lights and shadows in the landscape, and of a character which shall give value to its salient features, is true art. We have also received from Mr. Smith some examples of the cloud negatives he publishes for the use of the profession. These are on paper made transparent by waxing, and possess many advantages over glass negatives for this purpose. They may, for instance, be used on either side, a convenience in suiting the form of the clouds to the composition of the landscape which only those who have worked in this direction can fully appreciate. The slight trace of texture in paper is a positive advantage in securing an effect of atmosphere. Mr. Smith's residence on a seacoast on the west gives him unusual facilities for obtaining grand skies and effective clouds, as the examples we have received furnish evidence. The variety of effect in each negative gives them especial value, as by moving the negative a little up or down, or

laterally, a totally different sky may be given to different landscapes, from the same negative. Paper also possesses advantages in being easy to handle, or to cut, and presenting no risk of breakages.

As these negatives are issued at moderate prices, as may be seen in the announcement of the publishers, Messrs. Marion, on another page, they come readily within the reach of everybody, and they will, we doubt not, materially contribute to improve and elevate the character of many landscape photographs.

A TOUR THROUGH BRAZIL.

HERR HEILER, a member of the Berlin Society for the Advancement of Photography, who has just returned from a tour in Brazil, gave an interesting account of his work and adventures at a recent meeting of his brethren in the Prussian capital. A large collection of stereoscopic pictures which he had taken excited considerable interest from the circumstance that they represented for the most part the primeval forests of Parana, and included much wild and impressive scenery. Some wonderful formations of rock to be met with in that part of the world were depicted, as also many groups of local Indian tribes, whose portraits proved of particular interest, although the lady members of the races appear to have no claim to be considered beautiful.

Notwithstanding the many difficulties which Herr Heiler experienced in his travels, the pictures he brings home are very clear and clean, and despite climatic vagaries are possessed of excellent detail and delicacy. Accompanying the photographer on his cross journey through the country were two friends, an architect and an engineer. Eleven mules served for the transport of the luggage, and two blacks acted as attendants. The apparatus had need to be very solid and well packed, for not only were the attendants exceedingly careless, but the path through forest and jungle, which had frequently to be cut with the axe, necessarily presented repeated difficulties, and many and hard were the knocks to which the packages were subjected. Moreover, mules have the disagreeable quality of throwing off their load whenever they can, and unfortunately there is little opportunity on the way to repair damages.

The subject of provisions also caused the party some anxiety, and everything pretty well had to be taken along with them, since supplies were rarely to be obtained on the road. The best food to transport was dried meat (since it was portable and light, and could be preserved good for a long time), and a small kind of black bean, together with coffee and flour. Water seldom failed, but it was little good calculating upon game; there is plenty in the dense woods and thickets, but it was not easily come-at-able.

The luggage of the party was packed in good stout boxes, not too large, of which each mule carried two, one on each side. The harnessing and packing require, however, particular care, for the animals are easily wounded or injured, and are thereby incapacitated from acting as pack animals. Hamlets or plantations are rarely met with. The traveller is kindly treated by the inhabitants, but must pay dearly for all necessaries. Coffee, for instance, cost in Brazil, where coffee is grown, three times as much as in Europe. In regard to the Indians, they are a little difficult to deal with, since the traveller is unacquainted with their language, customs, and habits. Above everything it is necessary to be provided with a sufficiency of presents for them, in the shape of glass beads, coloured cloths, and, indeed, any glittering or coloured articles, which need not be useful so long as they are pretty to look at. At the same time showy articles should be avoided in one's attire, such as shining buttons and buckles, as these provoke the envy of the Indians. With the aid of such things to barter and exchange, one can get on very well with the Aborigines.

The fear of the mules and dogs for wild animals is very remarkable; they easily detect an old resting-place, even if it is fifty paces distant. Of poisonous snakes Herr Heiler found no lack, but the bite of these reptiles may, it seems, be easily cured by dropping ammonia into the wound, and drinking some of the same in a dilute form.

The improvising of a resting place for the night, and the preparation of the evening meal, were the most tiresome tasks, because they often came at the end of a fatiguing day. The labour of journeying was very great, and as there is an absence of bridges, where unfordable rivers were met with a raft had to be constructed. The mules were unloaded, the goods and *personnel* placed upon the self-constructed float, and in this way the party was ferried across, the animals being left to follow by swimming.

The cost of the expedition, which lasted from the 17th May to 9th December, is calculated by Herr Heiler at 2,000 thalers (£300), a high price, but accounted for by the costly character of provisions and necessaries. The result is a series of three hundred negatives of stereoscopic character, taken on nine by eleven-inch plates. The collodion Herr Heiler took with him from Germany was found to be unserviceable on his arrival at Brazil, having been destroyed by the heat, and he was compelled to set to work and make some fresh material for himself. In fact, all Herr Heiler's work was done with freshly prepared collodion, made just before use.

PIGMENT PRINTING IN SUMMER.

Dr. VOGEL, who has now for some time past occupied himself not only with the theory but the practice of carbon printing, publishes a few notes in the *Photographische Mittheilungen* as to pigment printing in hot weather. As everybody knows, who has had the least experience in working with bichromate gelatine, it is in summer especially that difficulties arise in its manipulation, and Dr. Vogel avers that by following the advice he gives the operator may fearlessly work the permanent printing process in hot June weather when the thermometer marks 26° Reaumur in the work-rooms. Dr. Vogel's notes are as follows:—

1. The bath for sensitizing is made up of:

Bichromate of potash	...	...	4 parts
Water	...	...	70 "
Alcohol at 87°	...	...	80 "

The solution is kept cool, not by means of ice, but with cold water.

2. The pigmented tissue is dipped in, back uppermost, turned quickly, and the fluid shaken, so that every part of the tissue is thoroughly moistened; it is then taken out. The tissue loses a little of its colour by this mode of operating, but does not run in drying, notwithstanding the heat. After two or three hours the tissue is dry. The alcoholic bichromate bath is only used once.

3. The printed tissue is covered with a one per cent. collodion, and thoroughly dried in the dark; it is then wetted and squeegeed as usual, either upon glass or transfer paper. Undertaken in this way pigment printing is almost as certain in summer as in winter. A grain-like structure is seldom met with; whereas in the case of uncollodionized tissue a grain is nearly always to be remarked in hot weather.

[The coating of the printed carbon tissue with collodion prior to development was proposed in these columns by Mr. Baden Pritchard on the 27th April, and he employs the plan at Woolwich. Not only has it a tendency to check reticulation, but, according to Mr. Pritchard, simplifies the printing process, the washing of the collodion film and soaking of the tissue proceeding simultaneously. The plates are simply waxed, and not collodionized, in this case.—Ed. P.N.]

SECURING VISIBLE PICTURES IN THE CAMERA.

Dr. LIESEGANG writes in the *Moniteur de la Photographie* on this subject. A statement having appeared that M. Willems has succeeded in securing visible images in the camera without development, Dr. Liesegang reminds photographers that he published a method of doing so as far back as 1864, in the *Photographisches Archiv*, and in the *Photographic News* of September 23rd of that year.

To accomplish the result it is necessary to have a good collodion, a silver bath, and a solution of pyrogallie acid (one gramme of acid in two hundred and fifty grammes of water) to which have been added ten grammes of acetic acid. The collodion should have such a consistence and composition as to yield a fine milky film in the silver bath.

The operation is simply as follows. A glass plate is covered with collodion, and plunged into the silver bath in the ordinary manner. The film is taken out as soon as sensitized, and allowed to drain. Then a little of the pyrogallie acid solution is poured into a small vessel, and the film covered with it three or four times. The plate is then put into a dark slide and exposed as usual in the camera; on withdrawal, it will be found that an image ready developed stands revealed upon the film. If a little more vigour is desired, this may be brought about by treating the plate with a further quantity of pyrogallie acid solution, to which a few drops of a solution of nitrate of silver have been added.

Similar results may be secured with a solution of acetate of lead in acetic acid, and with a solution of tannin.

In the same article Dr. Liesegang informs his readers that he describes a method of observing in the camera the actual coming of the image.

LIGHT THROUGH BLUE GLASS.

The chemical action of light in photographic operations, and in promoting vegetation and activity of plant life, is supposed to be very similar, if not identical. The following precise statement of the effect of blue glass on the germination of seeds, given with great precision by a correspondent of the *Scientific American*, will therefore be interesting to photographers.

"Having procured two small tin boxes, and filled them with garden soil, I put into each box six peas (each pea weighing exactly six grains), and six kernels of popcorn, each kernel weighing exactly three grains. One box I covered with strips of blue and common window glass, the proportion of blue to common glass being about four to one. The other box I covered with common glass. I watered the contents of the two boxes once a day with the same amount of water, at the same temperature. At the end of two weeks I removed the earth from the young plants by gentle agitation in water, carefully dried them between sheets of blotting-paper, and weighed them, with the following results:

BLUE GLASS.			COMMON GLASS.		
No.	Corn. grs.	Peas.	No.	Corn. grs.	Peas.
1	0	0	1	19.0	0
2	19.5	37.0	2	23.5	36.5
3	16.5	33.0	3	23.0	34.5
4	16.0	21.5	4	16.0	37.5
5	18.5	31.5	5	26.0	17.0
6	18.5	19.5	6	18.5	0
Total	85.0	142.5	Total	126.0	125.5
Average	17.0	28.5	Average	21.0	31.37
Increase	14.0	22.5	Increase	18.0	25.37

"It will be seen that, after deducting the original weight of each, the average increase of the corn under the blue glass was fourteen grains, while the increase of that

* Failed to germinate.

under common glass was eighteen grains, or four grains in favour of common glass. The average increase in the peas under blue glass is 23.5 grains, while under the common glass it is 25.37 grains, or 2.87 grains in favour of the latter. There was but little difference in the time of germination. The corn under the blue glass was streaked lengthwise of the leaf or blade with deeper and lighter veins of green."

ON THE DEPTH OF PRINTS AND INTENSITY OF NEGATIVES.

BY CAPTAIN ABNEY, R.E., F.R.S.

At intervals during the last three years or more I have been comparing the truth of photography as regards depth of shade with the shades to be found absolutely in nature, and have arrived at results which are worth recording, as they apply to the reproduction of negatives. As regards original negatives, the research does not apply, as the effect of the translation of colour into shades of black and white is almost beyond the power of investigation with the knowledge which we have at present. The time may come, and probably will, when such will be feasible; and though the inclination may be to say, "What's the use of it?" still, like other subjects which, apparently, have no practical bearing, in the end it is probable that such an investigation may be a paving stone in the path which tends to the attainment of some knowledge of still real utility. The subject on which I am at present writing, however, is, I hope, of immediate value both in regard to the object with which I have begun the present article, and also as a means of increasing our knowledge of the means of measuring the effects of different intensities of light.

In a communication made to the Photographic Society in May of 1876 I showed an instrument I had devised for registering the actinism of daylight, and in describing a method of integrating it. I gave a description of a revolving drum by which the reading would be effected. That same revolving drum it is now necessary to describe somewhat more fully, as part of the results obtained depend on a right knowledge of its use (fig. 1).



Fig. 1.

In the figure, which is the same as that which accompanied the paper referred to in the News, some slight additions have been made. On to the revolving cylinder are placed sectors of dead black paper placed on pure white paper. Each sector is accurately cut to exactly the same length, the breadth of each being invariable. Such a disposition of these alternating black and white sectors is shown in the figure. Let B be caused to rotate rapidly by means of A; at a point half way on the length of the cylinder manifestly we shall have half black combined with half white; if a quarter of the way from the bases of the black sectors, there will be three parts black to one white, and so on. By placing a scale (C) divided into twentieths of inches on the top of a rider in which a slit has been cut (in order that only a small portion of the cylinder may be viewed at once), it is evident that any shade of grey may be compared with the shaded grey tint of the revolving cylinder, and the ratio of black to white in the observed grey determined. When chloride of

silver paper is exposed to light the tint it assumes unfortunately possesses a decidedly bluish tint, and a comparison of such paper darkened by light with the shaded grey of the cylinder becomes impracticable, unless an artifice be resorted to. The artifice consists in employing light of some monochromatic colour. If the blackened paper, for instance, be examined in the light of a sodium flame, the blue colour is entirely eliminated, and we have merely the yellow component of the white left in the chloride of silver paper, mingled with a certain proportion of black; similarly the rotating cylinder, when viewed in the same light, would have its gradation formed in "yellow greys," if the expression may be allowed. Now the blue of the darkened silver paper must of necessity be mixed with a proportionate quantity of black, however deep the tint may be; hence to measure the darkening of the paper, it is quite legitimate to compare its yellow grey with those of the cylinder. This might not be the case had it not been proved experimentally that the same values were obtained for any number of differently darkened papers when viewed by various monochromatic colours, and a large part of the experiments were undertaken in order to clear up every doubt on this particular branch of the subject.

I may here parenthetically remark that the place on the cylinder where equal proportions of black and white are mixed does not at all correspond with the spot that would be selected by any unbiassed person who was asked to select a shade which would be a grey intermediate between black and white; the point he would select would be nearly a quarter way from the bases of the black sectors. The intermediate greys are at correspondingly proportional distances. As this part of the subject does not legitimately belong to photography, I merely mention it as curious. An investigation into the subject has been carried out, and will be shortly published.

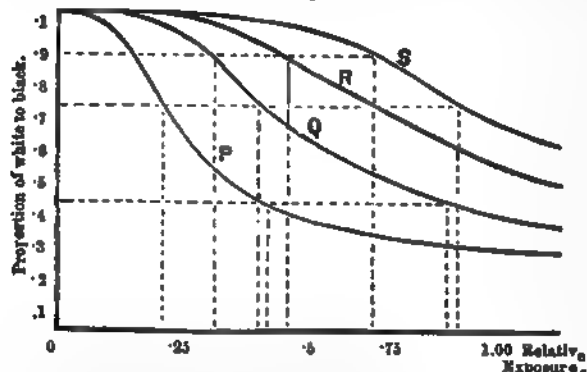
This rotating cylinder, then, I have employed as my standard of grey, referring all measurement eventually to it. Of course it was necessary to compare the whiteness and the blackness of the papers, and this has been by means of zinc, oxide, and deposited lampblack. All readings have been reduced to these standards. It may, however, be objected that black reflects a certain amount of white light, and this is no doubt the case; but this difficulty is reduced to a minimum where the light falling on the cylinder is so arranged that the reflection there may be passed away from the eye. I have compared the blackness thus obtained with that due to absence of light at the extremity of a long tube, and have found that any error that may exist is so small as to be incapable of affecting the accompanying results, being less than the error that is likely to occur through defective eyesight.

The first experiments that were undertaken were with a view to obtain the different degrees of blackening due to different quantities of exposures and different intensities of light. For the first, exposure was given to uniformly sensitive paper beneath a rotatory wheel, in which the exposure increased in arithmetical progression. It is hardly necessary to describe this piece of apparatus, as it has already been described in the *Philosophical Magazine* and in the columns of the News. Manifestly, by this means, however variable the light might be, the resulting blackening would be due to the mean intensity of light acting during the varying times. The accompanying diagram shows the reading of strips of sensitive paper so exposed when reduced to the proportion of white to black (fig. 2).

The ordinates or vertical lines drawn to meet the curve from the horizontal line measure the amount of white in the darkened paper at each point of its length, unity means the number representing white, being the amount of black mixed with the white, the length of the tint being represented by the length of the scale. Thus at P a point .32 of the total length of the strip, and consequently measuring .32 of the total exposure, the amount of black

In the tint is about .52 of total blackness mixed with .48 of white curves. P, Q, R, and S are curves representing the greys of different strips which have been examined. P was exposed for such a time that the most exposed point was on the verge of bronzing, from which it will be seen that light cannot tint the paper to acquire a depth equal to total black. The other curves, Q, R, and S

Curves showing gradations of shade in chloride of silver paper caused by different exposures.



were exposed for shorter times in the order given, so as to ascertain whether the curves varied in curvature. A reference to the figure will show that within the limits of error of observation and uniformity of paper the curves agree well. For instance, draw horizontal lines from .4, .7 and .85, cutting the curves as far as possible. Now, if the curves are comparable, the abscissae where the curves are cut should be proportional. Comparing Q and S, the abscissae of the former at ordinate .85 is nearly .30, and at .7 is .40; of the latter .61 and .78. The two sets of readings are nearly proportional to one another. Taking one more comparison between the curves P and Q, we have for P, when cut at the heights .42 and .7, .38 and .21 respectively, and for Q .72 and .41, which are nearly proportional. This shows, then, that the curves given by exposures increasing in arithmetical progression are uniform and of definite curvature. A study of these curves shows that the blackening by no means increases according to the length of exposure: that where the exposure is either short or prolonged, the curve is not steep enough; and that for the mean exposure the rate of blackening increases too rapidly.

The application of this will be seen in another portion of the subject.

THE ACTION OF PIGMENTS AND GLASS COLOURS UPON TINTED BROMIDE OF SILVER.

BY PROFESSOR H. VOGEL.*

THE observation made by me that certain substances, like aniline colours, when added to white bromide of silver, are in a position to increase the sensitiveness of the latter for the yellow, red, and green rays of the solar spectrum, has led to the assumption on many sides that the depiction by the camera of oil paintings and other coloured objects in all their natural degrees of light and shade must be possible. Many questions that have recently reached me on the subject have shown me that it would be desirable for me to reiterate once more what I stated two years ago in *Poggendorff's Annalen*.

It is an error much disseminated in the scientific and photographic world, that the chemical action of ordinary pigments, and those employed in glass staining, is analogous to the coloured rays of the solar system. Although everybody knows that the colour of pigments is never pure, still people have no hesitation in assuming that the action of the colour in pigments is the same as that of the

dominant colour which our eyes appreciate. Seebeck, Suckow, A. Vogel, and Doebereiner, all observed that certain chemical actions of light—as, for instance, the formation of muriatic acid from a mixture of chlorine and hydrogen, &c., &c.—do not follow under exposure to red light, but take place when the light comes through blue glass; and the results of modern photography, which reproduces blue very often as white, while green, yellow and red are frequently rendered black, support these observations. I have, however, in a table of colours which I made public, already shown that these reproductions are not always the same; that certain yellow and red pigments—for instance, Naples yellow, light ochre, and lake, as well as certain blues, such as Prussian blue and indigo—only act slightly upon the photographic plate, and, therefore, in an opposite way to the corresponding spectrum colours. These results are easily accounted for by the optical composition of the colours in question.

In a more startling manner still does the contrast between spectrum and pigment colours manifest itself when in the case of spectrum yellow and spectrum red, sensitive bromide and chloride of silver plates are employed for the production of a colour table. When the difference in sensitiveness between the silver salts is taken into consideration, the same results pretty well are secured, whether chloride, bromide, or iodide of silver is employed, with or without the addition of a pigment. That is to say, certain sorts of blue, like ultramarine and cobalt, act in the same way as white; while certain sorts of red and yellow, such as chrome yellow, red lead, and cinnabar, act like black. Even the increased sensitiveness of bromo-iodide of silver for spectrum green has, in the case of short exposures for the depiction of green pigments and green leaves, little of the influence it is given credit for, since a table of colours secured by the aid of iodide collodion gives green quite as vigorously as bromo-iodized collodion under the same circumstances. It is only in the case of long exposures that the favourable working of bromo-iodide of silver for green comes out prominently.

In practice, therefore, it may well be assumed that in the case of wet bromo-iodized plates, the action of coloured pigments depends in the main upon the amount contained in them of spectrum indigo and violet. Only it appears beyond a doubt, that in the employment of a naphthalene chloride of silver plate, which is as sensitive to spectrum-yellow as to spectrum-blue, the action of yellow pigments must be perceptible; and yet it is only the case in a very slight degree. The reason for this is easily found when the relative luminosity of the spectrum colours is taken into consideration, which has hitherto been left out of the calculation when making a comparative estimate of the action of spectrum and pigment colours.

Vierordt has lately specified the relative luminosity of the several parts of the spectrum, and gives the following figures to represent the light intensity of portions of the solar spectrum:—

In red, near line B	...	...	2
In orange, near line C	...	...	12
In yellow, near line D	...	...	76
In yellowish-green, between lines D and E	...	...	100
In green, near line E	...	...	37
In light-blue, near line F	...	...	12.8
In dark blue, near line G	...	...	0.8
In violet, near line H	...	...	0.07

According to this statement, the proportion of light intensity of the spectrum blue near G to the spectrum yellow near D is almost as 1:100.

No yellow pigment shows, however, such a high light intensity in relation to blue. An intense chrome yellow scarcely appears four times as light as a dull ultramarine, and a plate which is as sensitive for spectrum-yellow as for spectrum-blue (although the first is a hundred times

* *Photographische Mittheilungen*.

more light than the last) will, therefore, in the time by which it would be vigorously marked by the ultramarine, betray but a very weak impression of a neighbouring chrome yellow, which only appears four times as light as the blue. The weak impression should be, indeed, one-twenty-fifth of the other. If, therefore, the action of a yellow pigment is required next to a blue upon a sensitive plate, the latter must either be lit through a suitable yellow glass, by means of which the blue is sufficiently interrupted, or the sensitiveness of the collodion film for yellow must be increased. The results given by tinted chloride of silver lead us to hope that this is possible.

At present but very few colouring matters have been examined. The investigations, however, so far as they have gone, have amply proved the fact of the photographic action of an absorption medium in the sensitive film, and there should be no difficulty in discovering other colouring matters which possess the qualities of absorption in an increased degree. Of course, only such colouring matters are to be employed which are inimical to the preparations used in photographic manipulations.

Correspondence.

PRODUCING COMBINATION PICTURES.

DEAR SIR,—With a view to assist any young beginner who would wish to produce what may be termed a composition picture by means of photography, it may be of service to point out what are the necessary details and rules to enable the pictures to be understood by the public and appreciated by the artist.

First and foremost, the composer must imagine some subject—an incident or occurrence which happened at a certain place, on some particular day, at a certain hour—and all the various details of that occurrence must be vivid in his recollection or imagination. The landscape, the accessories, the figures, their dress, attitudes, and the expression of their countenances must all help to tell the intended meaning of the picture. It is evident that the camera, having no intelligence, cannot imagine anything; therefore any occurrence that has passed cannot be reproduced by it except by obtaining a company of actors to represent it. We know how rare the gift of mimicry and expression of the passions is even in first-rate actors; how, then, can he hope to surmount this difficulty? Should his artistic talent be so excellent as to enable him to design such figures, I should say he had better keep to the brush and let photography alone. It is, in fact, simply a work of supererogation, wasting talent and time; and, after all, the photograph produced is merely a copy of an artist drawing, and subject to contain not only the fault mentioned by Professor Green, but others quite as fatal to its estimation as a work of art. Therefore I should consider what may be termed historical painting as beyond the art of photography. But there are many subjects less pretentious and complicated, which are quite within the powers of photographic art, and would really form more beautiful pictures, for we all know that it is not the multiplicity of adornments that makes anything become beautiful, but their simple, natural, and tasteful arrangement. Allowing that there are subjects which can be executed by pure and simple photographic composition, let us examine the different branches of artistic knowledge required to ensure success, and without which the only sensation the pictures are likely to cause is contempt.

The art of painting is divided into four branches, viz., design, chiaroscuro (or light and shade), colour, and effect; and pictures are estimated by connoisseurs according as they may contain more or less of these qualities; and it is considered that no painter, ancient or modern, was ever pre-eminent in all of them. Design, the first to consider, and certainly without which all the others may be considered useless, comprises perspective, geometry, proportion, and expression. The first object in the education of

an artist is that he shall attain a facility of hand—that is to say, that he shall become, by practice, able with ease and truth to form the outline of anything he may wish to copy or imagine; and it is necessary that the studies shall be of the choicest execution and character, that his hand, his eye, his taste, and manner may be educated at the same time. Photography, giving as it does the design of all objects mechanically, would seem to render the labour unnecessary, but not so if the pupil wishes ever to raise himself above the level of his apparatus, but is content to remain for ever a mere machine. For such I do not write—it would be useless.—I am, dear sir, yours truly,

JAMES MARTIN.

A REFRESHING DRINK FOR THE STUDIO.

DEAR SIR,—During the recent hot weather, when the temperature has averaged 85° and 90° in my studio, a glass of something refreshing has been very acceptable. Being a teetotaler, I did not care for a draught of "Bass" ale, and ginger beer is not to be relied upon for quality, so I made the following:—

Loaf sugar	...	...	2 pounds
Tartaric acid	...	...	1 ounce
Essence of lemon	...	...	30 drops
Essence of almonds	...	...	20 "

Dissolve the tartaric acid in two pints of hot water, add the sugar, and lastly the lemon and almond; stir well, cover with a cloth, and leave until cold; put two tablespoonfuls into a tumbler, and fill up with cold water. This drink will be found much more refreshing and more palatable than either ginger beer or lemonade, and as the above ingredients only cost elevenpence halfpenny, and make ten pints of delightful drink, it will be found to cost less than one-half of ginger beer, and I am sure if once tried will be generally used by those that are engaged in close, over-heated, and ill-ventilated dark rooms.—Yours truly, A. J. JAHMAN.

[The addition of a very little bicarbonate of potash to each tumblerful just before drinking will give a wholesome effervescent drink to those who may prefer it.—Ed.]

COMMERCIAL DRY PLATES.

DEAR SIR,—From time to time I have read with interest letters from Captain Turton to the News on commercial dry plates, and some remarks by you on the same subject in your last issue, and I fully agree with him with regard to the great carelessness, in the preparation of commercial plates, which is but too often met with; but, as you say, it is quite impossible to cry down any particular firm or firms in the public journals, owing to the law of libel; and at the same time I do not see how otherwise the object in view can be gained. The annoyance caused by carelessly prepared plates is hardly conceivable, especially when the photographer is in a distant land. In my own case, during the cruise of the *Pandora* last year to the Arctic seas, I almost solely depended upon dry plates (prepared by a well-known firm) for all shore work, and found them invaluable; hardly a plate failed, and they had to pass through the most trying ordeals; but, unfortunately, a large majority were spoiled simply by careless manipulation in their preparation. It was trying in the extreme, after a hard fight to secure some particular view or object of interest, to find, on developing the plate, that it was ruined by comets or streaks, caused by uneven pouring off of the emulsion. In many cases I found the backing had made its way on to the face of the plate, and this alone is enough to spoil any plate. I see no remedy in the matter, unless the makers allow us to have two quality plates, and charge us different prices. Let one column in the price list be for ordinary or carelessly prepared plates, and the other for plates prepared with extra care. We could then, at any rate, be sure of what we were purchasing—at least, I hope so. If I could be certain as to what I was using, I should purchase and use large quantities of commercial

plates; and I have heard many, both amateur and professional photographers, say the same; but as it is, it is mere waste of money and time.

The dry plate makers must be doing as much business as they care to, or else it stands to reason they would give us better samples of their work. With regard to the firm which supplied me in the *Pandora*, I have to say that their plates behaved admirably, with that one fatal exception, namely, that so many were imperfect from careless preparation.—I remain, yours truly,
W. J. A. GRANT.

PRINTING WEAK NEGATIVES.

DEAR SIR,—I presume all photographers will occasionally be unfortunate enough to produce negatives possessing bad printing qualities, arising either through under or over-exposure, or from insufficient intensity, or many other causes. To those who are not already aware of it, I recommend printing all such negatives either in the sunlight or shade (as may best suit the negative) under opal glass, which confers upon the prints a brilliancy and delicacy far superior, and altogether unobtainable through the medium of tissue paper, or any other which I have yet tried. Without further eulogium I leave it, confident that those who give it a trial will find it all I have said.
Jno. WORSNUP.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual holiday under the auspices of the Edinburgh Photographic Society took place on Thursday, the 12th inst. The arrangements, as usual, were undertaken by the Out-door Committee, and with one or two exceptions the whole of the principal studios in the city were closed.

As was to be expected, in the case of a class which enjoys so few holidays during the summer season, many went off to visit friends on trips of their own, but the great feature of the day was, as usual, the general excursion, which, on this occasion, was to the frequently visited Almond Dell by the canal.

The canal, which in pre-railway times was one of the great highways between Edinburgh and Glasgow, is now almost disused, but still kept in perfect order, and run, at least so far as the beautiful Almond Dell, through a fine tract of country, and is, especially at this season of the year, with its grassy banks and their profusion of wild flowers backed by hedges of hawthorn, dog-rose, and sweet briar, one of the most charming routes by which a journey can be made. The swift boats, so called because they did the journey in twelve hours, have, of course, long ago disappeared, but an ordinary barge, aided by an awning, a few yards of gaily coloured calico, and a liberal display of bunting kindly lent by Messrs. Knox, Samuel, and Dickson, made a very good substitute. The weather, which had been for some days disagreeably wet, looked somewhat threatening, but the photographers have faith in their friend the sun, who has never yet failed to shine on their annual holiday, and so by a little after nine o'clock the whole party were on board. Under the direction of the stewards, distinguished by badges provided by the ever-thoughtful secretary, Mr. Mathison, things were rapidly got into "ship-shape," and at 9:30 the anchor was weighed, or would have been had there been one, but, instead, the order was given for the horses to go. Mr. Kyles, of Portobello, was, as on former occasions, master of ceremonies, and under his active management the stringed band, occupying the stern of the vessel, was kept hard at work, dancing being kept up with much spirit, much to the apparent enjoyment of the younger members of the party. Nor were those who were too old or too lazy to dance left without means of enjoyment, as, during the intervals between the dances, the piano was kept busy accompanying the singers, of which there was a good supply, for both solos and parts. Where all did so well and so willingly it would be invidious to particularise, but we cannot avoid saying that, as on previous excursions, a number of the employees of Messrs. Ross and Fringle gave ample evidence that the encouragement so long given by the firm to the practice of vocal music is still continued.

In addition to the great beauty of the canal banks and the country through which it winds, in its serpentine path, there is another charm to the parties forming such an excursion as that we are now describing, in the fact that the enjoyment of the day

commences with the journey, and lasts during the whole time, while in the more modern method of travelling, especially if the distance be considerable, the excursionists spend, it may be, hours cooped up in parties of eight or ten, in comfortable compartments of railway carriages. The dancing and singing were varied by lunch, and an occasional stoppage at some of the more beautiful places, that a scamper along the banks or across the fields, and a gathering of wild flowers, might be enjoyed; and in this way Almond Dell was reached at about 1:30.

On landing, the party broke up into quiet cosy groups of two, or happy laughing threes or more, and betook themselves, some—especially the twos—to the shady woods, some to riverside to enjoy a "paddle in the burn," some to a quiet lounge on the grass, and some to visit the quaint picturesque old mill in the bottom of the glen, and have a chat with the old miller, or a flirtation with his son. Here the mysteries of the manufacture of oatmeal were fully explained and practically illustrated, much to the delight of many who, although they had all their days been familiar with bannocks and brose, knew little or nothing of how the raw material was produced.

While all this was going on Mr. Annan, or rather his assistant, had been rigging up a dark room, and getting his plates prepared, and by-and-bye the party were assembled, and grouped for a photograph. Only those who have tried it know the difficulty of successfully photographing a large number of excursionists. Fun and frolic being the order of the day, all are as ready to go off into a hearty laugh, and rarely indeed is the funny man absent, or fails to give the required touch. On this occasion, however, all went well, and two plates were exposed under favourable circumstances, at least so far as stillness on the part of the members was concerned, and although the light was not so good as could have been wished, two very fair pictures were obtained.

On the intimation that dinner was ready, a general move was made to the barge, which had rapidly been converted into a comfortable dining-room, and the tables liberally supplied with good things in Mr. Pillan's best style, to which such justice was done as is only seen under similar circumstances.

After dinner, the President, Mr. LESSELLS, who occupied the chair, said that the stewards had wisely arranged that there were to be no toasts, as he had no doubt that all were anxious for yet a little longer to continue the quiet rambles that had apparently been so much enjoyed, or to take part in the games that had been provided. There was, however one toast that ought not to be omitted—"Continued Prosperity to the Edinburgh Photographic Society." Of all the good work that it had done, there was none more to be appreciated than the annual institution of the holiday, and in view of the very happy day that they were spending, and the capital arrangements that under its auspices had been made for their enjoyment, he was sure they would respond heartily to the toast.

Dr. JOHN NICOL said that, although the stewards had left toasts out of the programme, there was one which even they could not object to; one which they themselves had been drinking more than once during the last few days, and which he knew would be, by all present, received with enthusiasm—it was the health of the last new member added to the Society. Most of those present knew that the work of the Secretary was very heavy; but they knew also how industrious, persevering, and willing a secretary Mr. Mathison made, and as he never hinted at a difficulty in getting through it, they would be as much surprised as he (Dr. Nicol) was to learn that he had, a few days ago, gone and appointed an assistant secretary without consulting a single member of the Society. Others might have done as much, and nobody would have thought anything about it; but he was quite sure that those who knew Mr. Mathison best were the most surprised when they heard the good news. Yes, he repeated, it really was good news, as all who had seen her on board to-day must have been satisfied that he had made a good choice. He was quite sure the union would be a happy one, and asked all present to pledge a full bumper to the health and happiness of Mrs. Mathison, their new assistant-secretary. The toast was received as it deserved to be, and followed by the usual song expressive of the good qualities of the happy pair.

After a couple of hours spent in games, for which a number of appliances had been provided, and strolling along the dell, according to the tastes of the members, the barge started on the return journey, and the music and dancing were resumed after tea and a liberal supply of its usual accompaniments had been enjoyed. In consequence of a general disinclination to go home while daylight lasted, the halts were more numerous than in the morning, and the raids on the wild flowers so extensive that, by-and-bye,

the barge looked like a moving flower garden, or fashionable flower show, or musical promenade. Shortly before reaching Edinburgh, Councillor Hay, mounted on the quarter-deck, said that he had been asked to discharge a pleasant duty. He was aware that many wondered wherein lay the cause of the success of the Edinburgh Photographic Society, but he thought that it was not far to seek—it arose altogether from the fact that the office-bearers were the right men in the right places, men who were equally at home in discussing the merits and demerits of the last new process, or organizing and carrying out a social gathering; men not merely able to devise, but not above bearing a hand in the carrying out, of anything that would tend to promote harmony and good fellowship amongst all connected with the Society. "I have, then," he went on to say, "much pleasure in proposing a vote of thanks to the President, Mr. Lessels, for the honour he has conferred on me by being present to-day, and for all that he has done to promote the success of the excursion."

The President, in replying, said that when, on his return from the Continent in November, he found that he had been made president of the Society, he thought the members had made a mistake, and undertook the duties with no little fear. Now, however, he was glad to say that he went to the work with real comfort, everybody seemed to work so smoothly with everybody else that it became really a labour of love, and he was quite sure he spoke for the rest of the office-bearers, as well as for himself, when he said that it gave him much pleasure to see the little that they had to do thoroughly appreciated. As for the excursion of to-day it had been a great success, and he had enjoyed it thoroughly. The evening had been good, so had the dancing, the concert, the day, and the dinner. The latter item, in all such meetings, was an affair of much importance, and he thought the members would not be fully doing their duty unless they accorded a hearty vote of thanks to the parveyor, Mr. Pillans. Those who walked about the town must have been struck from time to time by seeing his name appearing over the door of shop after shop, and could not fail to come to the conclusion that he, at least, was a successful man. I am sure we congratulate Mr. Pillans on his success, knowing, as we do, how thoroughly he deserves it, and that for the best of all reasons—doing the very best he can for his customers.

By this time twilight had deepened into gloom, and while Auld Lang Syne was being sung, the barge was made fast at her destination shortly before ten o'clock, and amidst much hand-shaking and mutual congratulations the gathering was adjourned till July, 1878.

Talk in the Studio.

SMALL POX AND LIGHT.—Dr. Robert Charles Croft, Uxbridge Road, writes:—"Any suggestion which helps to mitigate the effects of this fearful disorder deserves consideration. Will you therefore permit me through your columns to ask those having the care of small-pox patients to try the plan of hanging the windows of the sick chamber with yellow calico: preparing it, in fact, as if for photographic purposes. I don't know to whom the original suggestion is due, or from whom I heard of it, but the results in treatment have been so remarkable that I feel it to be a duty to call attention to it in the most public manner, and therefore beg you to insert this. We have yet a great deal to learn about the actinic properties of light, and we may some day find that the proper management of light will be a great aid in the treatment of disease."

QUEENSLAND POLICE COURT.—Richard Katschbrook, of No. 155, Fleet Street, photographer, and John Baker, of No. 31, Gray's Inn Road, porter, were brought before Mr. Thomas Gabriel on a warrant for selling obscene photographic prints.—Mr. Collette prosecuted, and Mr. Blinson appeared for the prisoners.—Mr. Collette said that the prisoners would be charged with selling indecent photographs, and each with conspiring with the other to sell the prints. Hereupon they had only been able to get at the retail dealers, but they were anxious to reach the wholesale dealers. They had very great difficulty in getting at them, as they only served the trade. They had, however, found on the premises of Katschbrook about 400 negatives of an indecent character. Evidence in support of Mr. Collette's statement having been given, the prisoners were remanded until Friday, and bail was refused.—*Daily News.*

To Correspondents.

F. J. D'ARNA.—Stereotyping is a skilled industry requiring considerable experience for its successful practice. It consists in pouring molten metal into the matrix or mould. The metal is a mixture of lead and antimony. The precise technical points upon which success depends we cannot tell you. Your best plan will be to seek an opportunity to see the process in practical operation. We regret that we cannot help you to an opportunity.

C. L. B.—The loss of tone when the prints are in the fixing bath may be due to many causes; amongst which we may name the following: insufficient depth of tone in the gold bath, and the use of too strong a fixing bath, defective paper. But by far the most common cause is the use of a poor negative, which does not permit the print to be printed sufficiently deeply in the shadows before the face or other lights are over-printed. This is a very common cause; there is not a sufficient body of reduced silver in the blacks to give a rich tone. The print looks very well in the gold bath; but after fixing it is either a drab brown, or slate colour. Use a more vigorous negative, and this difficulty will disappear. Avoid the carbonate of soda in your fixing bath. 2. You did a foolish thing in adding ammonia to your bath, inasmuch as when you subsequently added nitric acid you formed nitrate of ammonia, which is a solvent of oxide of silver, and is an almost certain source of fog. Pour the second bath you made into a flat dish, let it have a few days of strong sunlight, filter, then try it.

STUDIO.—A primary requisite to brilliant tones is a good brilliant negative. With most commercial samples of albumenized paper a forty-grain silver bath is strong enough. For warm purple tones we recommend the acetate bath. To each grain of chloride of gold add thirty grains of acetate of soda and eight ounces of water; use a day or two after mixing. It is not necessary to use warm water in summer. Jackson's dyes will tint the whole picture, lights and shadows alike.

SEXTON.—For art instruction applicable to photography you cannot do better than thoroughly study Robinson's "Pictorial Effect in Photography." It is the only special work devoted to art teaching for photographers. When you have thoroughly mastered, understood, and assimilated the teachings it contains, you may with advantage study other works on art.

PARLAPAR.—The stain to which you refer is most probably due to the albumenized paper having dried irregularly after exciting, drops of the silver solution standing on the surface, instead of the whole draining off regularly and permitting regular drying. It most frequently happens with very highly albumenized paper, and especially if it be kept very dry before exciting, and is sometimes removed by keeping the paper in a moderately damp place a few hours before exciting. The use of a somewhat weaker nitrate bath is sometimes found a remedy. Thanks for photographs of earrings. When such tear-like drops are seen to be forming they should be removed by applying small pieces of blotting-paper, or indeed a sheet of clean blotting-paper may be applied to the whole sensitized sheet, taking care, however, not to remove all the free silver, which would result in a weak flat print.

M. F. B.—The rapid decomposition and turbidity of the intensifying solution of pyro and silver may proceed from two or three causes. It may arise from the addition of insufficient citric acid, it may arise from the use of silver solution from the bath, or from some other silver solution not quite pure; it may arise from the pyrogallol acid being old and not in good condition, it may arise from intensifying in daylight. Probably you may find the source of your trouble in some one of the causes mentioned.

A. B. C.—It appears to be inevitable that you must work with a south light, as it will undoubtedly be desirable to have the thirty feet for the length of your studio. We should build a ridge-roof studio, as you will then secure the north roof light, which will often be valuable. On the south side you will require facilities for receiving the light through tracing linen, or some similar medium for breaking and diffusing the direct sunlight. This may be done permanently by obscuring the glass with a coating of starch, or through tissue paper attached to the glass, but as there are many days in which no direct sunlight occurs, it is scarcely desirable to obscure the glass permanently. Actual experience in the studio will govern your decision in this respect.

ONE ANXIOUS TO EXCEL.—Different photographers use different substances for stopping-out skies for double printing or other purposes. Some use lamp-black ground up with a little size or gum water. Some use the black varnish sold for backing glass positives. Many use a mask of blackened sensitive paper, working close up to the horizon, with a little of any non-actinic water-colour. Any of these plans answer. The use of yellow or black water-colour acutely applied with a camel-hair pencil is the proper mode of filling up the holes in the sky of your negatives. We regret that our duties compel imperative observance of the rule not to answer queries on subjects of this kind by post.

J. C. STAMMERS.—Both are good and contain valuable hints. No. 1 is the most comprehensive, and is really a very valuable work. The price is 2s. 6d. We have pleasure in hearing from you. Several Correspondents in our next.

The Photographic News, July 27, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE FRENCH SOCIETY OF ENCOURAGEMENT—ILLUSTRATIONS OF LACE MANUFACTURE—GLASCOLE IN THE GERMAN LABORATORIES—INTENSIFICATION OF CARBON IMAGE.

The French Society of Encouragement.—The French, apparently, do not believe in endowment of research, but they are quite willing to pay for results, and a Society which is termed *Société d'Encouragement pour l'Industrie Nationale à Paris* has published a long programme of what it promises to do for those who successfully solve a series of problems about which philosophers have been posing their heads for some years. We do not think the promises held out in the form of a series of prizes will materially encourage anybody to undertake serious and laborious investigations which he would not otherwise contemplate, any more than a successful investigator would withhold from the world the fruits of his labours should these happen to be of paramount importance. But those who do solve knotty problems in chemistry, agriculture, mechanics, and other important domains, certainly deserve all they can get in the way of prizes and awards, and for this reason the *Société d'Encouragement* should be spoken well of. The *Société* takes time by the forelock in making its arrangements, and in its prospectus talks familiarly of the year 1882, at which date, to be oracular, those of us who are alive will have aged considerably. The *Société* will award fifty-five prizes up to that date, varying from sums of five hundred francs to twelve thousand, or, in other words, from twenty to four hundred and eighty pounds. In all, we are told, the *Société* has 106,000 francs at its disposal (£4,240), and the prizes are to be awarded in different branches. These six are devoted to problems in mechanics, eight to industry, five to agriculture, and two to the fine arts and their application in industry, one of the latter being for the best photo-type process with half-tone. There are, moreover, no less than twenty-four prizes to be awarded for the accomplishment of various matters connected with chemistry. Anybody may compete for prizes, whether inhabitants of *la belle France*, or foreigners, for the *Société d'Encouragement* only occupies itself with general progress, no matter from what side it may come. The prize offered to photographers—or those, rather, who busy themselves with photo-mechanical printing—is one of two thousand francs, and in this case the details of the invention must be lodged at the office of the *Société*, in Paris, before the first of January, 1880. In the words of the prospectus, the prize will be given "to the discoverer of a process which permits of the transformation of a negative, taken from nature, with finely graduated tones, into a block capable of being printed in a printing press with type." The block must give the half-tone and delicacy of a photograph, while at the time it must present no other difficulties in the matter of printing than would be the case in regard to an ordinary wood-cut or cliché from the same. In respect to the other problems connected with chemistry, &c., for which the numerous prizes are to be awarded, we must refer our readers to the prospectus published by the *Société*, which may be obtained by addressing the Secretary, at the Rue de Rennes No. 44, Paris. The only award relating to photographic work is the one we have specified.

Illustrations of Lace Manufacture.—Photography in book illustration is always valuable, since it presents us with a truthful representation which other arts do not always afford; and when, moreover, the subject is suitable for photographic illustration, then the importance of the book is increased many fold. In a series of works which have lately appeared in several countries on the subject of lace manufacture, this is especially the case. Our readers may remember that we have already spoken in these columns of the use made of photography in connection with the sewing

of lace, the work girls being supplied with a representation of a real bit of the material, instead of simply a bald pattern. The hand-made lace is made in small quantities by different hands, and then fitted and stitched together subsequently into a piece of some size. Where several hands, differing from each other not only in skill, but in other qualities also, are thus engaged on the integral parts of a whole, it is very unlikely that these different parts will accurately resemble one another, particularly as the girls have simply a rough outline sketch to guide them, which is widely different from the lace itself when finished. There is, in fact, much left to the discretion of the girls, and as they are not all guided by one mind, there must naturally be considerable discrepancies in the work, even when this is pieced together with tact and judgment. The recent introduction of photography in lace warehouses has, therefore, done much to equalise the work and render it more uniform than it used to be. Instead of a pattern roughly limned on paper, each worker has now a photograph given her, which is to the eye, to all intents and purposes, a bit of lace, since the pattern is taken from an exceptionally nice piece of work, prepared on purpose by the most skilled hand in the factory. Furnished with this, the girls have no difficulty in keeping to the pattern, and making all the pieces identical as regards the stitching and the intervals in the open work. Publishers have not been long in finding out how useful books upon lace manufacture might be made with illustrations of a similar character, and the consequence is that during the past year or two a collection of such books has been brought out. Thus we have one issued at Leipzig which goes methodically into all sorts of fancy needlework; another at Paris, quite as exhaustive, apparently, and entitled *La dentelle, histoire, description, fabrication, bibliographie*; a third appears in Austria, at Vienna, under the title of *Spitzen Album*, which contains a description and illustration of old point lace in the Imperial Museums; and finally we have a volume in London upon *Ancient Needle-point and Pillow-lace*.

Glascoole in German Laboratories.—The employment of glass-wool—or, in other words, very fine spun glass—for laboratory purposes, seems to be gaining ground among German photographers. No doubt, for the filtration of collodion, as also in the case of acids and strongly acid solutions, glass-wool will be found convenient, and where before chemists were wont to use asbestos and powdered glass. The manufacture of the new filtering medium has consequently been warmly taken up, and we find that it may be now purchased at no very exorbitant rate. Glass-wool is very light, too, and may be used over and over again, for it is easily washed and freed from foreign matter attaching to it. These qualities are prepared, it seems, but only the first is recommended for photographic use, since both the filtration of collodion and the silver bath, for which it would be mostly used with us, are delicate operations, and require to be well and carefully performed. The glass-wool should, therefore, be of the purest and finest quality—such as is sold at the rate of a mark or shilling per five grammes, or at fifty-five shillings a pound. Coarser qualities of the material for the use of manufacturing chemists are to be had, charged for at half this rate.

Intensification of Carbon Images.—In respect to the communication recently published by M. Stefanowski upon intensifying carbon images,* exception has been taken at the Vienna Photographic Society, by Dr. Eder, on several points. Dr. Eder's name is well known to our readers as one who has made an exhaustive study, in connexion with Captain Toth, of lead intensifiers. He thinks that many of the intensifiers referred to by M. Stefanowski will not yield permanently tinted carbon prints, and that while they may be suitable for diapositives, where the tint is only temporarily required for producing negatives, it will not be well to employ some of the intensifiers where pictures are required to be kept; particularly the colouring matters of

* See PHOTOGRAPHIC NEWS, 30th June.

organic origin, as also those which are formed by sulphur in combination with iron, nickel, or cobalt, are not to be relied upon. It is the same with images in which the blue cyanide compounds are formed. Dr. Eder thinks it well to publish this warning, which photographers will do well to bear in mind.

SKYLIGHTS AND SIDELIGHTS.

BY R. J. CHUTE.*

THE light is the most important feature of a photographic gallery, and yet it is the one in which the most mistakes are made in construction. Too often, however, the photographer is the victim of circumstances, in that he is obliged to conform to some condition of the building, such as its situation, its surroundings, &c., which he knows to be unfavourable for his light, and which will put a severe tax upon his skill to ensure success. Then again there are others who go to work with everything in their own hands, and construct the worst kind of a light that human ingenuity can devise.

But photographers are coming to a better understanding in regard to lights, and many enquiries during the past spring show them ready to accept what has been proven to be the best.

A photographer is sometimes deterred from locating in business because he cannot find a light or locality to suit him. This is well; it is better to be cautious than reckless, and yet there is not much risk if one has the ability to adapt himself to circumstances. In lieu of a skylight a high sidelight may be used till a good skylight can be secured or built.

Having had some recent experience in fitting and working a high sidelight, I was much pleased with the results secured by it. It was about twelve feet square, and situated due north. I ran a blue, opaque curtain across the bottom so that the top of it was about four and a half feet from the floor. Above this were two breadths of white muslin curtains, running on wires so as to be readily adjusted to the requirements of the light or sitter. On the shadow side I placed a screen of a light neutral tint, which being moved near or far from the subject produced the desired effect. In addition I ran a white curtain on a wire across this side screen, at about the height of the sitter's head, for the purpose of lighting up dark or tanned faces. This light for single heads I found to work remarkably well, producing negatives as well lighted and of as fine modelling as could be produced under most of the combination lights.

But, remember, I do not advocate such a light for all work, or advise any one to adopt it for a permanency; but photographers are often out of business, or looking for locations, and as sidelights are more readily found and fitted than skylights, it would often be better to locate temporarily with the former, till a suitable light could be found or built, than do nothing.

The combination, or top and sidelight, is the best adapted for all work, and no photographer should think of locating permanently without the very best light he can secure. The most common error in skylights is the height. In many cases this is from choice, as high lights have their advocates, who sustain them from theory rather than from practice; in many others it is from necessity arising from the construction of the building, which cannot be altered. But a photographer had better reject a location altogether than accept it with an unfavourable light, for success depends upon that more than upon any other part of the gallery.

The loss of light, which is the principal objection to a high skylight, may be compensated for by making the light proportionately larger. As, for instance, suppose a light sixteen feet square and eight feet high above the

head of the sitter; the latter would receive the same amount of light above an angle of forty-five degrees as under a light twenty-four feet square and twelve feet high; but place the sixteen feet light at the height of twelve feet, and there will be a loss of fifty per cent. in the amount of light admitted to the sitter.

Thus it is clearly to be seen, as all practice proves, that a high light will work slow compared with a low light of the same size. But as there are many high lights in use, the successful working of them depends much upon the arrangement of screens and the methods of operating. I have recently had occasion to work under one of these high lights, and a little talk about it may not be without interest. It is a combination top and sidelight, but the latter is so obstructed by a building opposite that it is mostly a top light. The lowest part of the top light is fifteen feet from the floor, and the highest more than twenty. To make this manageable I placed a series of curtains of drab cambric just high enough to clear the backgrounds. They are hung on wires running across the room, and are low enough to be easily manipulated with a short rod, thereby dispensing with all cords and pulleys.

On the side light a curtain of the same drab material covers about four feet of the lower portion of the light, and above that are two breadths of curtains which extend high enough to meet the curtains on the top. Just above the top curtains I arranged several frames covered with white tissue paper. These are for use when the sun shines, and may be slid away from under the light when not wanted.

With this arrangement fine effects may be secured, though it is difficult to get quick sittings, even by opening the full light. It is only one more argument against high lights, and I trust that photographers who may contemplate reconstructing or building a light may learn the lesson beforehand, and not, when it is too late, regret that they build their lights so high.

LIGHTING FOR STEREOSCOPIC PORTRAITS.

DR. VOGEL, in his letter to our Philadelphia contemporary, gives some interesting remarks by Herr Goltzsch on the subject of lighting the model for stereoscopic portraiture. He says:—

"What we find passable, or even beautiful, in plain photographs, will have a disturbing and strange effect in stereoscopes, and this circumstance occurs much more in portraits than in landscapes or architectural pictures. Up to this time the portrait stereos were taken with the same lighting as common pictures. For the latter a heavy contrast of light and shade is necessary to bring out their forms; but this is to be omitted in stereoscopes of near subjects as well as portraits. Therefore it is improper to light in the same manner as though we intend to make effective cartes-de-visite. The deep dark shades do not add to their effect in the stereoscope; but, on the contrary, pictures which seem to the eye flat and monotonous, are often very effective in the stereoscope. For this reason it should be tried to take portrait stereos in full light, with but very little shade. It is a fact, that portrait stereoscope pictures have received, so far, but little approbation, not only in Europe, but also in America, though it seems to me there are made more portrait stereos there than here. If the matter were treated in the proper manner, it would merit the approbation of the public in a greater degree; but I recommend the use of lenses with a short focus, especially when half-length pictures are to be taken, or they will show excessive plasticity, so that the head often seems to be several feet in front of the body. Take lenses of eight to nine inches (equivalent focus), the centre points of which are not farther from each other than two-and-a-half inches."

* Philadelphia Photographer.

LACONICS.

BY W. HEIGHWAY.

Do not waste leisure hours—*Practise!* Study what you have heard, read, or seen, in lighting, posing, and manipulation, and work out the lessons.

Would you acquire information? *Read!* Would you progress in art? *READ!!* Would you make money? *READ!!!*

Study the work of others, and try to understand in what it is good or bad; and see how its errors are to be avoided, or its beauties imitated.

Servile copying requires no more ability than allowing your neighbour to work out a sum, and then cribbing the answer.

Govern your retouching pencil, or it will make a slave of you.

Never say of your work, "Oh! it's good enough for the price."

We should, in matters of taste, be *above* the general public, and strive to raise them, rather than sink to a vulgar level.

The educated eye alone can see effective points and defects in the sitter. Strive by observation and study to acquire this valuable power.

Truth should be the chief feature of a portrait. Flattery should not be resorted to—even with your sweetheart; it is inartistic!

Photography and truth are united by art.

You cannot do good work until you find out you can do bad. It is difficult to make a donkey go straight, because—he is an ass.

Some photographers are so conceited they cannot see the blemishes in their own work, any more than they can see beauties in their neighbour's. How can they expect ever to excel?

Take care of your health—resurrections don't take place now-a-days.

Keep your dark room well ventilated—and, too, keep it clean: it is healthy for you and for your work.

Too often the lighting of the sitter and the good character of the negative are sacrificed to the thought that the retouching will remedy all defects. It is very like neglecting to get out of the way of a homicidal cart, because you believe the doctor will be able to cure the broken limb.

So many negatives are spoiled by over-retouching, one is almost inclined to say, do not retouch at all.

When things work badly, don't blame the bath, the developer, the camera, and the sitter: try a little more carefulness.

When matters get very trying, lay on your sweetest smile, and try to charm them into better ways.

If the bath is pinholing your plates, you may sometimes cheat it by tilting the bath forward on the immersion of the plate, so that the collodion surface faces downward.

When I come across a man who says he can never see any use in books on photography, and that he never learnt anything yet from them, I try to discover what he knows. *It is never worth the search.*

theless, as it may be found of use in many applications, and capable of doing good service in certain circumstances, I have here set down in a few words how a good result may be obtained with little difficulty.

When it is a question of producing a typographical block, a zinc or copper plate is taken from three to five millimetres in thickness. This is grained, and while warm covered with a light coating of wax. Upon the wax a carbon tissue is developed in the ordinary way, and further treated with alum, and dried. The plate is then immersed in benzole, or any other solvent of wax, and in this way all parts of the metal surface are bared except those covered by the carbon image. These bare portions are to be acted upon with acid. The carbon image, in truth, only acts as a covering to the wax, and prevents this from being dissolved away by the benzole where the image is to be; the acid etches the metal afterwards wherever the latter is not covered up.

To obtain type blocks an ordinary negative cliché is taken, which gives, after etching with acid, the image in relief, and in this state it may be printed from in an ordinary press. If, on the contrary, a positive cliché is made use of, you secure a block which can only be printed in the same way as an engraved plate, the image produced being an *intaglio*. It is possible, however, to secure a plate for printing in an engraver's press, with the aid of an ordinary negative cliché, by having recourse to another method of proceeding. This consists in recovering the zinc plate bearing the image with a deposit of copper by means of the electrotype process, and removing the pigment afterwards with hypo-chlorite of lime and boiling water, and afterwards the wax with benzole. Finally, the plate thus prepared is etched with acid, the aid of a battery being recommended to bring about a more perfect result. In this case the thin film of copper which has been deposited resists the action of acid, which attacks the zinc, however, with considerable vigour. To succeed well with the process, it is necessary to have clichés of a very clear nature, in which the blacks are very opaque, and the whites free from fog, while the carbon tissue must not have been exposed to the light in any way, for otherwise a slight insoluble film will be formed over the plate, which will materially interfere with the perfection of the result.

This plan of operating has much in common with that described by Mürkl, and which was published in this journal (the *Moniteur de la Photographie*) in October, 1876; but in that case the employment of asphalt dissolved in benzole is recommended for making the reserves of the plate prior to the development upon it of the carbon image. I find that wax is much better for the purpose, for while I have frequently had instances of failure with asphalt, I have never met with defects when wax has been used for treating the zinc plate in the first instance.

I am now engaged in further studying the subject, with a view, if possible, of securing photo-engravings or phototypes having half-tones. My experiments are being conducted with gelatine, and I trust by means of this substance to secure photographs from a press, and printed in greasy ink, and with the same gradations as those secured with silver salts. I shall not fail to make public my results, if they should turn out preferable.

A SIMPLE PHOTO-GRVURE PROCESS FOR SECURING BLOCKS FOR PRINTING IN A TYPE-PRESS.

BY ERNEST BOIVIN.*

THE shortcoming of this process, like that of many other methods of the same character, is to be found in the fact that it will not permit of the reproducing of the half-tones of a negative. It is only capable of employment in the case of clichés taken from engravings or designs executed in line, &c., where only blacks and whites come into play. Never-

MODE OF REDUCING NITRATE OF SILVER IN WASTE SOLUTIONS.

BY F. FLAMENT.*

THE collection of argentiferous compounds from waste solutions has been an object of study with me for some time past. In my essays, which were rendered doubly interesting on account of the beautiful reactions to which they gave place, I desired more especially to exclude the use of flower sulphur, which is so generally employed, but which, on

* *Moniteur de la Photographie.** *Moniteur de la Photographie.*

account of its disagreeable odour, &c., is well left alone. The method I am about to describe renders one altogether independent of sulphur compounds, a desideratum of some importance, since the silver afterwards recovered is more pure.

The nitrate of silver in the disused baths and other solution is first of all turned into chloride. To do this, the liquids are put into an earthenware vessel competent to hold about double their volume, and I then add enough hydrochloric acid in sufficient quantity until a precipitate is no longer formed. After standing for some time, the upper portion of the liquid is poured off, and the remainder is treated anew with the same acid, but not quite so strong—that is to say, with ordinary commercial muriatic acid. The chloride of silver which has been deposited by this means is then washed until every trace of acid has disappeared, and afterwards pressed between sheets of filter paper, to facilitate its desiccation.

This chloride of silver is intimately mixed with carbonate of soda in the proportion of:

Chloride of silver, well dried	...	1 part
Carbonate of soda	... ..	2 parts

The mixture is filled into a crucible, and placed in a suitable furnace, and as soon as the mass is in a state of fusion, some bits of charcoal are thrown into it. Ten minutes afterwards the crucible is withdrawn from the fire, and on cooling there will be found at the bottom of the utensil a button or ingot of pure metallic silver.

In remote localities, where it is impossible to obtain virgin silver, I treat nitrate of silver in this way which I have previously obtained by dissolving silver coin in nitric acid. By treating a solution of this kind with hydrochloric acid, chloride of silver is precipitated, and I obtain in the end a pure metal free from the oxides of copper, which silver coins, as a rule, contain in the shape of alloy. It is true that these oxides do not dissolve in water, and consequently remain on the filter paper, but they are nevertheless in the mass, and hinder weighing accurately. In other words, pure nitrate of silver could not be secured by simply dissolving silver coins in nitric acid, and allowing the nitrate to crystallize out.

[We need scarcely warn our readers that in this country it is a criminal act to employ the coinage of this country in this way, or, indeed, to deface it in any manner.—Ed. P.N.]

THE LICHTDRUCK PROCESS.

BY M. COMTE LUDOVICO DE COURTEN.*

M. DE COURTEN employs patent plate glass from five to six millimetres thick, and he cleans it in the following manner. If the glass is new it is cleaned in the same way as a photographic plate, and rubbed with alcohol prior to use. If an old plate is to be cleaned, it is first of all cleaned with nitric acid, or caustic potash dissolved in hot water. Every trace of grease repels liquid, and causes fissures and rising of the film, and gives rise also to air-bubbles.

Solution for the first preparation of the plates.

No. 1.—Best gelatine	...	10 grammes
Cold distilled water for swelling the gelatine	...	250 "
No. 2.—Bichromate of potash	...	10 "
Distilled water	...	250 "

The two glass vessels which contain these mixtures are placed in a water-bath maintained at a temperature of not more than 50° Centigrade. When the solutions are complete, the gelatine is filtered through fine linen into another vessel also standing on the water bath, and then the bichromate solution is added, and the mixture allowed

to cool somewhat. Hereupon is gradually added 250 cubic centimetres of albumen made from fresh eggs, beaten to a froth, and decanted. It is filtered through paper, the liquid being maintained at 35° C. the while, and allowed to stand for an hour on the water-bath, the temperature of which should not be allowed to exceed 40° C. The plates are carefully covered with this solution, the former being placed in a horizontal position while the liquid is poured upon them. To make the mixture cover the plate perfectly a strip of clean paper may be used, breathing on the glass also facilitating the operation; and finally the superfluous liquid is permitted to run off at one of the corners. The drying of the plate takes place in the dark.

As soon as the first film of bichromated gelatine is dry, it is covered with a level piece of board covered with black velvet, and exposed to light from behind, the light acting upon the sensitive film through the thickness of the glass. By this operation the glass is made to attach itself more firmly to the glass surface. The exposure to light is continued until the film assumes a dark brown colour, or until a strip of paper dipped into the sensitive mixture shows 10° under Vogel's photometer.

After this exposure the plate is thoroughly washed in a zinc or enamelled iron trough until all the yellow bichromate is removed, and the film appears of a matt white. Then the plate is dried and preserved in a locality free from moisture. They will remain in a good condition for some time.

The second film may now be applied. The composition of this second preparation is rather elaborate, the following solutions being required:—

1.—Gelatine	...	45 grammes
Distilled water for swelling	...	360 cub. cents.
2.—Bichromate of potash	...	7.5 grammes
Bichromate of ammonia	...	7.5 "
Distilled water	...	120 cub. cents.

Two separate solutions are made at a mild temperature.

3.—Isinglass cut into strips	...	22 grammes
Distilled water	...	80 cub. cents.

The water in this case must be warmed to 90° C. in order that the isinglass may be dissolved.

When the solutions are prepared, they are mixed together and filtered through paper into a glass vessel standing on a water-bath heated to 50-60° C. At this temperature the mixed liquid is allowed to stand for about an hour and a-half, so that the operator may be assured that the liquids have properly united. The filtration of the liquid must take place by the aid of warmed filters, for without this precaution the liquids will become set, and the operation go on but very slowly. All precautions which were taken in the case of the first film must also be employed in manipulating the second. The drying cupboard must be warmed previously, and each plate, before being coated, should have a temperature of from 40° to 50° C. The second film is applied to the surface of the first. Two hours are required for the drying of the second film at a temperature of from 55° to 65° C. When dry the film appears yellow upon the plate; it should be matt and very even. The plates so prepared will remain in good condition for two or three days, if only properly kept in a cool place, in absolute darkness, and protected from moisture.

The next step is to print the film in a frame. In the first place there is laid upon the glass plate of an ordinary printing frame a piece of black paper in the form of a mask, the opening of which is of the form and size of the cliché to be printed. The negative is then placed upon the mask, and the prepared plate laid on the negative. It should be remarked that the negative must be a reversed one. The way to produce such a negative is well known. Either an ordinary negative is stripped from the glass by means of gelatine, or the cliché is taken by the aid of a mirror, or in any other way that gives a reversed image.

* Abridged from the *Moniteur de la Photographie*.

As already stated, an ordinary printing frame may be employed, but in this case it is well to employ wedges under the cross-piece instead of springs, so as to ensure more pressure and better contact. To cut off all light from the back a black cloth is laid over the glass plate.

The coming and progress of the picture may be watched from the back; all details must appear in brown. The plate is then taken out of the frame, and undergoes a lengthened washing to remove the bichromate. On drying, it is next brought into the press, and a sheet of paper put under it, so that the inking up of the image may be the better watched. At this point begins the work of the lithographer, and better than all instruction is a practical demonstration at a lithographic establishment. The preparation of the plate for printing is, however, a little different to that of a lithographic stone. Before the plate is inked up for the first time it is moistened for the space of a minute with cold water by the aid of a sponge. Afterwards the moistening operation need not last more than from twelve to fifteen seconds. The plate is then dried off by the aid of a soft linen rag, and again inked up.

The inking of the image is a very difficult matter, which not only requires very great attention, but also considerable experience and study.

EFFECT OF ACIDS AND ALKALIES ON GLASS.

In answer to a correspondent of our Philadelphia contemporary, Mr. Thomas Gaffield, whose communications to our pages, as a manufacturer of glass, our readers remember, gives the following hints as to the action of acids and alkalies on the surface of glass: the information will be useful to our readers.

"In a general way we may answer that no alkali has any effect on well-made glass, and no acid, except hydrofluoric acid, which is consequently the only one which can be used for etching purposes. In our chemical laboratories all acids and alkalies are kept in glass bottles, except the hydrofluoric acid, which requires vessels of lead or gutta-percha. But if glass be made in an imperfect manner, either from too great haste in melting, or from an excess of alkali in its composition, the action of the atmosphere alone, in connection with the affinity of alkalies for moisture, causes an efflorescence of the uncombined soda or potash, sometimes furrowing the surface in an infinitesimal manner, creating an iridescence, and sometimes disintegrating it in such a way as to produce all the appearance of ground glass.

"The natural surface of any glass is undoubtedly its strongest portion, and when that is removed, by grinding on the wheel or by hydrofluoric acid, the strength is materially diminished. Now, if the surface of an inferior glass is disturbed in any degree by the action of the atmosphere, as above indicated, or by contact with alkalies or acids, as suggested by your correspondent, just in that degree will it be weakened in strength. I suppose that most of the sheet glass sold for negatives is strong and well made, and not seriously affected by the removal of the films and subsequent cleansing. Of course, there are some exceptions, as it is difficult to achieve perfection in any manufacture, and it would seem that your correspondent has found by experience that his old negative glasses break more easily than new ones that have never been used, and, therefore, may not be of the best kind.

"It may be interesting to remind your readers that cases have occurred where the removal of collodion or gelatine films has carried away also a thin film of the surface of the glass itself. This, of course, would destroy or seriously deteriorate its strength and value.

"It would be quite interesting to hear of the experience of other photographers on the point of the strength of negative glasses after being in use several years. It is possible that a multiplication of experiments, and a scientific examination of the subject, may prove that a long exposure to sun-

light may not only change the colour of our glasses, but involve such a physical change in the molecular structure of the glass as to materially weaken its strength. It may be such a change as this, rather than the use of acids and alkalies, which weakened the glass of your correspondent after long usage and exposure to sunlight in making his negatives. This idea, however, is only a momentary thought of the writer, which is not to our knowledge suggested in any treatise on glass, and may not, after careful examination, be found to be sustained by any facts or reasonable theories."

A FEW WORDS ABOUT BURNISHING.*

To condensation of water contained in the alcohol need to heat the burnisher, more than to anything else, we attribute the trouble in burnishing. Another cause of difficulty in burnishing is the use of alum in any form, either in the silver bath or the washing after toning. We never use it, but I know some who do, who always calculate on fourteen prints to the dozen, expecting to spoil at least two of them in the burnisher.

We claim nothing original as a lubricator. At present we have got good effects by making a pasty mass of fine white wax and ether; this we spread on the woolly side of longnap Canton flannel, and rub the picture with it. Care must be taken not to have too much on the cloth, else some will get on the back of the card and stain it. A cloth properly prepared will lubricate a great number of prints, probably two hundred. Another very good plan is to procure a piece of white soap (glycerine or coconut oil soap); rub a piece of Canton flannel on this until it is coated, then rub the print evenly, renewing the soap on the cloth as required. Another way is to dissolve wax in alcohol, and apply with a broad flat camel's hair brush. The alcohol dissolves very little wax, but very little is required. We have done very fine burnishing with alcohol and glycerine applied with a flat brush. The formula is—

Alcohol	...	...	...	8 ounces
Glycerine	...	...	...	2 drachms
Essence wintergreen	...	...	...	40 drops.

This gives a pleasant perfume to the cards, yet not offensively strong.

The temperature of the burnisher has a great deal to do with the effect. Try a print when the planisher has just reached boiling heat, and the feed roll is comparatively cold; then let the heat be increased as high as possible without blistering the print, run a print through a few times, and "compare effects." That is the true test.

If kerosene is used as a heater, it is difficult to get a proper degree of heat, and there is great danger of smoking. If alcohol is used, "sweating" is certain, except in extremely warm weather. Before applying the alcohol lamp, see that the planisher is lowered at least an eighth of an inch; a quarter of an inch is better. It must be sufficient to prevent the water, which condenses on the feed roll, from touching the polished surface of the planisher, because wherever it does so a spot is produced with a rough edge, which must be polished off to avoid scratching the print. To polish, take a piece of soft pine, about an inch wide, and thin enough to run between the planisher and feed roll; pour on a few drops of olive oil, sprinkle with flour of emery, and rub the planisher lengthwise, from end to end. Two things are important: it must be flour of emery, and the stroke must not be short, but must go the full length of the planisher. Wipe clean with a cotton cloth, and with or without a lubricator you may go on with your burnishing fearlessly, unless you have used an acid in the previous manipulation, in which case a lubricator is an absolute necessity. No amount of burnishing will make dull, mealy, or half washed prints look well.

* Condensed from the Practical Photographer.

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THE FORTHCOMING PHOTOGRAPHIC EXHIBITION.

THE full details of arrangements for the next Exhibition of the Photographic Society are now issued, and they will, we doubt not, be found satisfactory to every one concerned. The Exhibition will, as we have before announced, be opened on the evening of Tuesday, the ninth of October next. There will be a conversation as heretofore, and the council have abandoned the plan, adopted on occasion of the last two or three soirees, which was found to work unsatisfactorily, of requiring what is known as "evening dress." "Morning dress" is on this occasion requested. We may, perhaps, remark in passing, that the edict for evening dress, which gave offence to some, and was inconvenient to many, was rendered desirable, we understand, from advantage having been taken of the freedom which prevailed at some of the earlier informal soirees, by some thoughtless persons, to present themselves in absolute working dress direct from the printing or operating room. This should be avoided.

Contributions must be sent in, it will be seen, not later than the second of October. The edict of the last year, which was found to work unsatisfactorily, prohibiting the attachment of a name to a picture, is not repeated this year. Nothing contributes more, we think, to the comfort of visitors than a neatly written label containing the title of the picture and name of the artist, so that these elements of information may be obtained at once without consulting the catalogue at every moment. The medals, it will be seen, are all of bronze, the distinctions of honorary value attaching to the use of different medals being avoided. The constitution of the jury this year will give the awards especial value, as the value of such awards is naturally increased by the character of the judges by whom such honours are dispensed. Besides three members of the executive of the Society, two distinguished Royal Academicians have consented to act, and two of the private members of the Society amongst the most distinguished by artistic culture and ability. We heartily hope the Exhibition will be worthy of the occasion, and we urge all our readers who can to contribute to its excellence and success.

The following are the arrangements according to the official programme just issued:—

The Exhibition of the Society will be held at the Gallery of the Society of Painters in Water Colours, 5, Pall Mall East, London, S.W.

It will be inaugurated by a conversation, open to members and their friends, at eight p.m. on Tuesday evening, the 9th of

October (morning dress). It will remain open daily (Sundays excepted), from nine a.m. till dusk, until the 15th of November. The evenings during which the Exhibition will be open will be announced subsequently.

Members will be supplied with tickets to admit their friends. An admission fee will be charged to all not provided with tickets.

Pictures for exhibition must be forwarded (carriage paid) to the Gallery, 5, Pall Mall East, London, S.W., addressed to the Secretary of the Photographic Society, so that they may be received not later than Tuesday, the 2nd of October, and accompanied by a letter of advice.

Each frame should have the artist's name and the subject written upon a label in front, capable of being easily detached as soon as the catalogue has been made out. No other marks should appear on the picture.

No picture in an Oxford frame will be admitted.

No picture previously exhibited in London will be admitted.

No coloured photograph will be admitted.

Not more than one frame of a dozen cart-de-visite or cabinet pictures can be received from any intending exhibitor.

No pictures whatever can be received after 2nd October, the day fixed for their reception.

A committee of selection will have the power of rejecting any pictures forwarded.

Bronze medals will be awarded as follows:—Two medals for those pictures which, in the opinion of the jury, shall display the greatest general excellence; two medals for the best landscape, ten by eight inches and under, and for the best above ten by eight inches, two medals for the best portrait, twelve by ten inches and under, and for the best above twelve by ten inches; two medals for the best single figure study, twelve by ten inches and under, and for the best above twelve by ten inches; two medals for the best enlargement untouched, and for the best enlargement and negative, both being the work of the exhibitor; two medals for the best genre pictures; two medals for the best photo-mechanical prints; one medal for the best study from animal life; two medals for the best instantaneous pictures; two medals for the best stereo six transparencies; one medal for the best frame of dry plate photographs; one medal for the best micro-photograph; one medal for the best specimen of surface printing from metal; one medal for apparatus. Three medals will be placed at the disposal of the jury for any novelty or other form of excellence in process or result.

The awards will be decided by a jury consisting of seven gentlemen: the President of the Society, two members of council, two members of the Society not being members of council, two artists of reputation (namely—E. W. Cooke, R.A.; Sir J. Gilbert, R.A., President of Society of Painters in Water Colours); James Glaisher, F.R.S., &c., President; Captain Abney, R.E., F.R.S.; T. S. Davis, Frederick Piercy, Robert Faulkner.

No awards will be made when the works in competition are not in the opinion of the jury of sufficient merit.

The competition will be open to all photographers, whether members of the Society or not, and foreign photographers are especially invited to contribute their works.—H. BADEN PRITCHARD, Hon. Secretary.

PHOTOGRAPHY IN NEW ZEALAND.

It not unfrequently happens that we have enquiries from photographers contemplating emigration, asking us for information as to the probable chances of employment as photographers in different colonies. An old correspondent of the NEWS, and a thoroughly experienced photographer, has recently emigrated to New Zealand, and sends us his impressions of photographic prospects in that colony, which are not, as will be seen from the following extracts from his letter, by any means favourable. Mr. Cherrill, it will be remembered, recently wrote from the same colony in a more hopeful strain; but the difference in the aims of the two writers must be noted. Mr. Cherrill went with the view of commencing business, and with capital enough to enable him to do so. Our present correspondent went out in the hope of securing fairly remunerative employment in some studio; in which hitherto he has failed. He says, writing from Dunedin:—

"I must confess I am much disappointed, as I have been

here now nearly five months, and have not succeeded in obtaining employment of any kind. I think some time last year you had an enquiry as to the chance of a photographer coming out here meeting with remunerative employment as an assistant. Should you be again asked your opinion on such a speculative movement, I think the best thing you can do would be simply to give Punch's celebrated answer to persons about to marry—*Don't!* as our kind are a drug in the market. Here is my experience to wit; and there is another who sailed from London just a month previously, after upwards of two months' residence here, finding there was no chance of succeeding, returned in the same ship that brought him out.

"The scenery about this part of the colony (the southern end) is magnificent for the painter, but the extraordinary darkness of the green of the herbage must mar any successful attempt at photographing the open landscape, although I have seen many beautiful pictures of the rocky fissures in the high cliffs, and which we call sounds here.

"In this city, of under twenty thousand inhabitants, there are seven or eight photographic establishments for portraiture, of which those of Messrs. Clifford and Morris and Mr. Burton (one of the Burtons of Leicester) take the lead. The pictures from the first-named establishment seem to please the public most, from the negatives being most carefully and *very extensively* retouched; and as this city is mostly peopled by the canny Scot (in fact, this province of Otago was founded by people north of the Tweed), red locks and freckles are very abundant, which you know do not look well in photography.

"Humbly has not been left at home, as I was much amused the other day by an acquaintance calling my attention to a new frame of specimens hung out to public view at a gallery entrance, and which were labelled as the newest and greatest novelty (photographic) of the age. You will think how much I was amused at this puff when, on going to examine these wonderful productions, I found they were nothing but specimens printed from very inferior negatives by our comparatively old and ancient process on opal glass.

"I brought with me my collection of photographs, those which you kindly sent me, as well as examples of Robinson, Lewis, Slingsby, Restall, and other good men, and I am much flattered by being told there is nothing to equal them in the colony.

"Mr. Morris, who is certainly the A1, has requested that I will sit to him, in order that I may send a specimen of his work to Abel Lewis, to show how gratified he was by seeing the pictures I have by Mr. L.

"Some two months since I replied to an advertisement for a manager of a photo. establishment in a provincial town, which brought an answer asking my terms, &c., and stating that a person was required to manage, to operate well (both in gallery and field), first-class retoucher, good colourist and stippler (how many such do you know?). I replied that I could operate well, could use a pencil to retouch a negative to some extent, and could tint, but did not profess to be a colourist in the art sense of the term; that I would commence with four guineas per week (the pay of a first-class carpenter) until the business was proved and expenses up. My specimens were returned, with the intimation that the advertisers were in treaty with another party on more favourable terms.

"One of my sorrows—and, perhaps, not the least—is the loss of my weekly pleasure of perusing the News. I have not seen its familiar type since the one dated the 29th of September. I think I must ask you to have it posted weekly for a twelvemonth.

"I must now conclude by hoping that you have been in the enjoyment of good health, and, as old associations are, on my part, treasured and unforgotten, remain, yours very faithfully,
J. G. STRANDBERG."

DISTORTION FROM EXPANSION AND CONTRACTION OF PAPER.

We have more than once recently called attention to the distortion in portraits caused by the unequal expansion and contraction in albumenized paper in the various wettings and dryings occurring in printing operations. Dr. Vogel, in his letter to the *Philadelphia Photographer*, gives some interesting experiences of Berlin portraitists. He says:—

"The distortion is different in the length of the sheet rather than in the width of the same; for this reason the picture, the negative of which is put on in one or the other direction while copying, seems to be considerably stretched in the length or in its width. I have seen pictures copied on albumen paper of the same sheet, under the same negative, on the same day, toned, fixed, and washed in the same manner, on some of which the face of the person was lean, and on others thick and puffed up. About this circumstance there was at one time much said, and many photographers, although the pictures showed the fault, denied the fact entirely. Especially those photographers who were working for builders and engineers could not be convinced, because they did not like to admit that their pictures were useless. It is evident that, if this distortion appears always, the proportions of measurement in drawings, &c., must become entirely different, and then, of course, the picture is not correct. One of these photographers, Mr. Marowsky, has investigated the matter carefully, and shown that the distortion on his pictures is, indeed, a very trifling one, or entirely unnoticed, even if he uses strongly albumenized paper. Thereby it is discovered under which circumstances the distortion especially appears. Mr. Lindner, who noticed the distortion on his cards in a very remarkable manner, was accustomed to trim his pictures immediately after copying, and then, as usual, he toned, fixed, and washed the same, and at once, after coming out of the washwater, he pasted them, and put them on Bristol board. In this case the distortion was a remarkable one. But if we allow the picture to dry after being washed, and paste it up, no distortion is to be noticed. The fact is that the dry picture during the short time of moistening with paste has no time to expand to any great degree. An expansion takes place, but at first in equal directions, which is harmless; for that reason we notice no distortion on pictures treated in that manner. But if the pictures remain very long in the water, the expansion in the width of the sheet from which they are cut is considerably greater than in its length; and when they are pasted up, this unequal expansion will remain after drying. The expansion is so remarkable that even the people notice it by comparing two pictures. Though the whole matter is a fault, under certain circumstances it is an advantage. Very often we find persons of excessive meagreness, who wish to appear in their pictures a little stouter, or stout persons who like to appear in their pictures more slender. By the above fault it is in our power to gratify their wishes."

ON THE DEPTH OF PRINTS AND INTENSITY OF NEGATIVES.

BY CAPTAIN ARNET, R.E., F.R.S.*

[In my last communication it must have been seen that there is a slight error in the diagram. At the extremities of the horizontal line the figures 0 and 1 should have been placed, and .25, .5, .75 should have divided this line into equal parts. The top figure of the vertical axis should have been 1, and not .1 as shown.]

Enquiries having been made as to the mode of obtaining a monochromatic light, I have thought it better to treat of this in my present article, before going further into the opacity of negatives and depths of prints. The most common monochromatic light, undoubtedly, is that caused by the introduction of sodium into a colourless flame. The

most usual way of obtaining this light is by taking a piece of platinum wire, and bending the end into a small loop about one-eighth of an inch diameter. By slightly moistening the loop a particle of common salt (sodium chloride) can be easily taken up by it. The loop holding the salt is next placed in the flame from a Bunsen burner or a spirit lamp, when the salt melts and forms a small transparent bead. Whilst still hot the loop is brought in contact with more salt. Another small crystal will adhere, and this should be melted into the first bead. This operation is continued till the loop is entirely filled. Sodium carbonate may be substituted for the chloride, and some people seem to find this easier to manipulate. The latter should be well dried before an attempt is made to form the bead, otherwise the attached moisture causes the crystals to fly off the loop when they are introduced into the flame. A couple of beads thus prepared will suffice to give a fair light if placed in the outer portion of a Bunsen or spirit lamp flame. The wires, for convenience sake, should be attached to stands, and should be placed as not to interfere with the light issuing in the direction in which the drum or any other object is to be illuminated. Where a larger volume of coloured flame is required, a bunch of asbestos soaked in a strong solution of brine may take the place of the bead; it will be found that this method has a slight tendency to cause a flickering, which is decidedly objectionable. It has been suggested to dissolve common salt in the spirit of a spirit lamp, in order to give an illuminating flame; this gives a feeble light, and the salt is apt to cake about the wick.

There is another method of obtaining the sodium light, which is, indeed, applicable to the light obtainable from any other easily volatilized metal. If a very fine spray diffuser be caused to play in the flame of the Bunsen burner a large volume of coloured flame results. For spectroscopic work this is invaluable. For convenience sake it is better to use some contrivance for keeping up the small current of air that may be required. One simple plan of effecting this is the foot blower manufactured by Fletcher, of Warring-

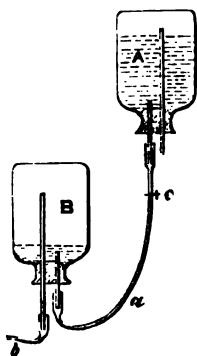


Fig. 3.

ton; another also suggests itself. Procure two large bottles with widish mouths, and fit each tightly with a cork; pass two pieces of glass tubing through the corks, one just penetrating the other almost reaching to the bottom of the bottle. Now nearly fill one bottle, A, with water, and replace the cork with glass tube attached. Invert the bottle; the longer piece of tube should be above the level of the water, the other end being open to the air, whilst the other tube should be closed to prevent the water flowing out. A piece of india-rubber tubing should be drawn over the end of this short tube, on which should be placed a pinch-cock, such as used by chemists, to prevent the flow of water, though an American clip will answer the purpose. The other bottle, B, is now inverted empty, and a piece of india-rubber tubing connects the long glass tube with the spray diffuser, whilst the short tube is attached to the india-rubber tube which has been closed by the pinch-cock, and which is attached to the short tube of A. The two inverted

bottles are placed in stands, A being placed higher than B. The water in A rushes out as fast as the air is displaced out of B, through the spray diffuser. A continuous current of air is thus kept up for some time, and the operation can be repeated by detaching the tube from the spray diffuser, and reversing the positions of A and B. Either a watery or an alcoholic solution of the salt to be used may be placed in the diffuser, as experiment may prove best. By this means a flame coloured by lithium, strontium, calcium, &c., may be produced.

When the examination is to be conducted by red light, however, it may often suffice to use flashed ruby glass placed in front of a paraffin lamp, which usually burns with a very steady flame.

To get almost absolute purity of colour, it is as well to use the spectrum; but unless the oxyhydrogen or electric light is at the command of the operator, this method is not admissible for working at night. Of course sunlight is *par excellence* the best, and it is from this source, from which the spectrum can be produced that will be described. A darkened box, A A, should be prepared (to place on the operating table, fig. 4), a convenient height for which

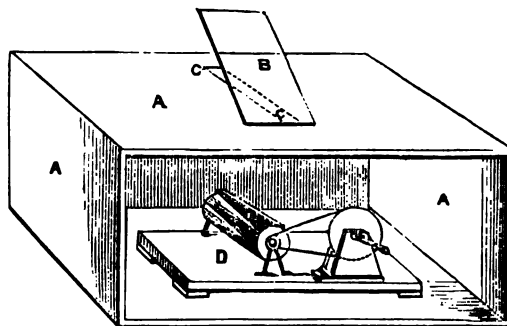


Fig. 4.

is about two feet six inches: one side should be open, but capable of being covered with a cloth to exclude all extraneous light. In the centre of the top of the box should be a mirror, B, six inches by twelve inches, placed in a plane of 45° with the top, and at right angles of the plane of the unclosed side of the box. Any light reflected from the mirror must be admitted to the interior of this box on to the table (or object D, placed on it) through a slit, C, of about half an inch wide and seven or eight inches long, at right angles to the mirror. This arrangement for obtaining the spectrum is shown in the accompanying diagram.

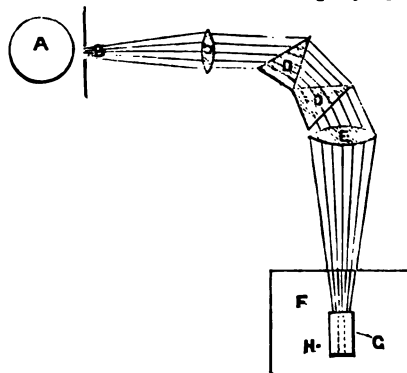


Fig. 5.

A is a glass jar of a cylindrical shape, filled with water, placed before a fairly wide slit three or four inches high. Into A is reflected by a looking-glass (not shown in the figure) sunlight. The distance of A from B is so adjusted that the slice of light refracted from it falls in the slit in B, so as just to fill it. C is a rough lens of about eighteen inches

focus, and capable of taking in all the light from the slit. It is placed so that the rays *slightly* diverge and fall upon two prisms, of which a fuller description will be given presently. These refract the rays till they fall upon E, another rough, convex lens of about four or five inches diameter and three feet focal length. The rays are received upon the mirror, B, attached to the box-lid in which the spectrum should be thrown fairly in focus. The box is now adjusted till any particular ray of light falls through the slit H on to the object D in the box. The width of the spectrum is enlarged by moving the lens C till it well covers the length of the slit. It will be seen at once that any monochromatic light may be employed by this artifice, and the illumination will be sufficient by which to obtain readings. (It should here be remarked that the rotation of the drum may be caused by attaching the large wheel to a fly-wheel and treadle. I have myself attached it to the table of a sewing machine.) Prisms of the size required, if made of glass, would be expensive. They may



Fig. 6.

readily be formed out of Winchester quart bottles, cutting them at the desired angle. If a piece of paper be fitted round the bottles, and they be immersed at the angle required, the water will give lines in the paper, from which a pattern may be cut to guide the cutting. When so marked, a small part of the line marked on the bottle should be filed, and the cutting finished by means of a pastile. The edges should then be ground on a flat stone, and two flat pieces of glass cemented on to the wedge, thus formed by means of a solution of glue and treacle to which a little glycerine has been added. A hole should be drilled at the top of the prism to enable carbon disulphide to be inserted.

In reading strips of darkened paper, it is sometimes difficult to ensure accuracy if the paper be glazed, owing to reflections from its surface. This evil can be nearly eliminated by causing the illumination to come through finely ground glass. In any case it is as well not to trust to observations taken by one person: at least two should take readings to prevent a chance of error, and they should be taken first moving the tint to be compared from the black end of the cylinder to the white end, and then *vice versa*. Personally, I prefer to read with one eye closed and accurately focussed on the junction of the tint with the rotating surface. I also find it necessary to have a uniform shade pasted on each side of the rider holding the scale, as, if one side be white and the other black, there is a decided tendency to get variable readings. My experience teaches me that the eye must be thoroughly trained before great reliance can be placed on any person's readings. Ladies—who are, perhaps, more accustomed to match colours—seem to judge more correctly at a first trial than do my sex. More than thirty readings without resting should never be attempted, as the fatigue to the eyes is very great.

ON THE IMMEDIATE AND POSSIBLE EFFECTS OF CERTAIN RECENTLY-PROPOSED ADDITIONS TO THE NEGATIVE BATH.

BY W. HOWARD.

"CARBON *shall* be king!" "Silver is our sovereign!" These are the battle cries that alternately stun and invigorate the contending factions of the photo-printing world. Fortunately, however, for the preservation of good-feeling, neutral—or, rather, mutually important—matters frequently claims their attention. I allude to the negative bath, without due attention to which, neither school of printers could be put into possession of negatives capable of pro-

ducing satisfactory proofs. True indeed it is that even that time-honoured "institution" may soon be dispensed with ("a consummation devoutly to be wished") but, while for all but special purposes it still remains the corner stone of the "black art," aught that may be written concerning it can scarcely be deemed "flat, stale, and unprofitable." This, at least, was my personal feeling, and, fortified by a hint from our energetic Editor, I have ventured to put into a readable garb a few stray observations affecting it.

Having, however, in my mind's eye the somewhat lame and impotent results arrived at by a "learned, grave, and reverend" body in a recent though long-prolonged discussion, I have carefully avoided any endeavour to flood with new light the subject of pinhole production. On the contrary, I have chiefly directed my attention to agents which are recommended for their removal, or to collateral matters. In the annals of photography, the year 1865 was, if my memory holds good, remarkable for the amount of attention devoted by experimentalists to the subject of pinhole production, and it was then fully demonstrated that the formation of nitro-iodide of silver in the bath, and its subsequent precipitation upon the plate, was the main cause of these pests. If to this we add the more recent discovery of the frequent production of sulphate of silver in the bath, we have about exhausted the catalogue of well-defined but unavoidable pinhole propagators. If any operator is careless enough to court danger by avoiding the minor trouble entailed by filtration, he scarcely deserves the mildest manifestation of sympathy on his behalf. I have just, perhaps, incautiously used the term "unavoidable," in speaking of the recognized enemies; at least one of them may be circumvented by Mr. Eliot's method of working—but of that more shortly.

Amongst the host of suggestions for improving the working qualities of our negative baths, or removing some of the many disorders to which they are liable, Mr. D. G. Munger's unpremeditated experiment with a piece of soda hyposulphite is worthy of attention, on account of the discrepancy which exists between the results obtained by him and those which the popular imagination had conceived would follow such an unorthodox proceeding. Mr. Munger's own words very well indicate the nature of this conception. He says:—"Judge of my surprise when, upon developing, not a hopeless fog, as I had expected, but an unusually clear chemical effect was presented." To put this sentence into other words, the addition of a small quantity of hypo reduces or prevents fogging. The first enquiry which I set to work to resolve was, naturally enough, "Does hypo possess this power?" The second, "What is the nature of the reaction which ensues upon its addition to the bath?" and the third, "Cannot the same end be achieved by less suspicious means?" I commenced operations with a newly-prepared neutral bath, which, if made with good nitrate, is the condition that, next to one rendered alkaline by silver carbonate, my experience, which is not professional, leads me to prefer. A few trial negatives were taken with this bath. The light was yellowish, being that of an evening sky, and exposures varying from five to eight seconds produced no fog; ten seconds were required for that purpose. The subject was the somewhat inartistic array of roofs, chimney-pots, and garret windows mixed with a liberal hand, and taken from the vantage-coign of a two-pair back. For the purpose in view this was, however, a sufficiently crucial test. The next step was to make the good bath into a foggy one; that was a thing easily accomplished by putting into it some silver oxide at the close of the evening, and permitting it to digest that until again brought into requisition.

Here I may remark that, as far as I can judge, nothing has more conduced to the general feeling of distrust with which alkaline or neutral baths are regarded than the fact that their alkalinity—or, as by a little carelessness on the part of the operator, it may have been called neutrality—

I must in fairness to Mr. Munger admit that at present I have not found these defects to occur; this I think solely arises from the fact that the experimental solution was used immediately after filtering off the sulphide precipitated by the hypo, and could consequently contain only the very slight trace of sulphate of silver derived from the oxide of that metal dissolved therein.

If any bath has accidentally been treated to a dose of "hypo," I would advise the addition of nitrate of baryta to get rid of the sulphuric acid. If a newly made bath does fog the plates, it can easily be rendered acid by the usual method (i.e., nitric acid), avoiding any loss of silver, and liberating no compound fraught with the possibility of future evil, as this process does.

(To be continued.)

Correspondence.

ADULTERATIONS OF NITRATE OF SILVER.

SIR,—I have been frequently asked by photographers how to detect adulteration in nitrate of silver, and it may prove of some interest to your readers to know that the adulterant is principally in the dust. Out of about twenty samples that have been sent to me for analysis, four were adulterated. The adulterant, which is usually nitrate of potash (saltpetre), is introduced in a powdered state, as there is no other way of safely mixing it, for it crystallizes in long needles, whereas nitrate of silver crystallizes in slabs. Owing to this, large crystals would soon betray the fraud; and the two salts will not crystallize together. This hint may be of some use to consumers. Of course unprincipled dealers have a ready answer to any objection made to the dust: either it is the bottom of the jar, or the nitrate has been shaken whilst travelling, or such like. A perfect sample of nitrate of silver must be free from any yellow tinge, perfectly white, and have a glassy appearance; the crystals must be large, and there must be no powdered substance mixed with it.

I hope you will kindly insert these few lines in your paper for the benefit of those concerned in photography.—I am, sir, your obedient servant, ALFRED LUTCHMAIN.

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of this Association was held the 4th inst., SIR ANTONIO BRADY in the chair.

The minutes of the last meeting having been read and confirmed, the SECRETARY read letters from Lord de Ros and Dr. Arthur Farre, expressing their regret at being unable to be present.

The following members and subscribers were elected:—Sir George Prescott; H. Davies, Esq.; Ernest Soutter, Esq.; J. W. Young, Esq.; R. Leventhorpe, Esq.; E. Swinburne, Esq.; A. Watkins, Esq.; Mrs. Herbert Evans.

The SECRETARY laid before the Council the pictures for the current year, and Mr. Glaisher, before reading his annual report, remarked that he and his brother referees, after carefully examining every picture, were much gratified to find that the negatives sent this season by the members were certainly better than those of any previous year. The works of Dr. Cooke, to whom was awarded the first prize last year, were even better than ever, and some magnificent pictures by Mr. R. O. Milne were deserving of especial attention; in fact, Mr. Glaisher thought that nearly every contributor gave evidence of improvement, and he considered that this sign of not merely sustained, but increased, vitality in the Society must be most gratifying to the Council, especially at this period of unusual depression.

The following is an abstract of Mr. Glaisher's report:—

Class 1 contains 90 pictures, contributed as follows:—Dr. Cooke, 17 large pictures; R. O. Milne, Esq., 13 large pictures; F. Beasley, Esq., 18; W. S. Hobson, Esq., 7. Major Chadwick, 7 large pictures; J. McAndrew, Esq., 5 Spanish scenes; R. Murray, Esq., 5 dry plate pictures; J. C. Stanning, Esq., 3; J. Adams, Esq., 3; W. Vanner, Esq., 3; T. Brownrigg, Esq., 2;

F. Schwabe, Esq., 2; F. Adderley, Esq., 2; Lieut. S. G. Fairtlough, 2; Capt. D. McNeill, 1.

Class 2 comprises 90 pictures contributed as follows:—R. Murray, Esq., 6; J. McAndrew, Esq., 6; Dr. Cooke, 6; Capt. D. McNeill, 6; F. Beasley, Esq., 5; F. Adderley, Esq., 5; P. Gunion, Esq., 5; W. Vanner, Esq., 5; W. H. Kirkby, Esq., 5; W. S. Hobson, Esq., 4; J. C. Stanning, Esq., 4; R. O. Milne, Esq., 4; Lieut. S. G. Fairtlough, 4; Capt. J. B. Fox, 3; Major Chadwick, 3; A. L. Stevenson, Esq., 3; G. W. Keeling, Esq., 2; T. Brownrigg, Esq., 2; S. G. B. Wollaston, Esq., 2; J. Adams, Esq., 2; F. Schwabe, Esq., 1; K. D. Roberts, Esq., 1; W. W. Unett, Esq., 1; Miss L. Cox, 1; W. Muller, Esq., 1; Mrs. Deeble, 1; Rev. H. Palmer, 1.

Class 3 comprises pictures contributed as follows:—F. Adderley, Esq., 10; S. G. B. Wollaston, Esq., 7; Mrs. Deeble, 9; Capt. D. McNeill, 7; J. McAndrew, Esq., 7; K. D. Roberts, Esq., 6; P. Gunion, Esq., 6; H. V. D. Esterre, Esq., 6; A. R. Hunt, Esq., 5; W. Vanner, Esq., 4; W. Muller, Esq., 4; Rev. H. Palmer, 4; Miss L. Cox, 3; A. L. Stevenson, Esq., 2. Lieut. S. G. Fairtlough, 2; J. Adams, Esq., 2; Capt. J. B. Fox, 2; E. Milne, Esq., 2; G. W. Keeling, Esq., 1; F. Beasley, Esq., 1; F. Schwabe, Esq., 1; G. M. Green, Esq., 1; J. C. Stanning, Esq., 1; R. O. Milne, Esq., 1; W. H. Kirkby, Esq., 1; W. W. Unett, Esq., 1.

The remainder of the pictures are arranged in Classes 4, 5, and 6.

The following prizes were awarded:—

Dr. Cooke, first prize, for Nos. 53, 57, and 62, a large Silver Goblet. R. O. Milne, Esq., second prize, for Nos. 53 and 62, a Silver Goblet. Major Chadwick, for Nos. 4 and 8, an Oil Painting in frame. F. Beasley, Esq., for Nos. 273 and 274, a large Album elegantly bound in morocco. W. S. Hobson, Esq., for Nos. 145 and 146, a ditto ditto. J. C. Stanning, Esq., for Nos. 38 and 39, an Oil Painting in frame. F. Adderley, Esq., for Nos. 13 and 14, a ditto ditto. R. Murray, Esq., for Nos. 118 and 121, a ditto ditto. W. Vanner, Esq., for Nos. 5 and 12, an Album, elegantly bound in morocco. T. Brownrigg, Esq., for Nos. 33 and 34, a ditto ditto. Lieutenant S. G. Fairtlough, for Nos. 5 and 8, an Oil Painting in frame. Dr. Cooke, for Nos. 56, 58, and 66, a ditto ditto. R. O. Milne, Esq., for Nos. 60 and 61, an Album, elegantly bound in morocco.

Certificates of Honorable Mention were awarded to Captain D. McNeill, J. Adams, Esq., F. Schwabe, Esq., and J. McAndrew, Esq.

A vote of thanks was proposed by the Chairman and seconded by Mr. Gooch, to Mr. Glaisher, for his able report; and a vote of thanks was proposed by Mr. Gooch and seconded by Mr. Howard to the referees, for the time and trouble they had bestowed in the examination, arrangement, and classification of the pictures. Both votes were carried unanimously. A. J. MALVERN, Hon. Sec.

Talk in the Studio.

THE LAW OF LIBEL.—Referring to some recent remarks in our columns on the possible interference of the law of libel in case of publishing adverse and injurious comments on commercial products, Mr. W. T. Bovey courteously writes to point out what he conceives to be an error in our view of the case. We expressed a conviction that a journal publishing a fair and honest report of proceedings which were libellous in themselves would be exempt from action. Mr. Bovey thinks this is a view of the law as it ought to be, but not as it is. A friend of his was recently mulcted to the tune of £250 for publishing a verbatim report of the proceedings at a meeting of a Sanitary Board, in which enquiry was made into the character and conduct of a parish official. On the other hand, Captain Burton is satisfied that any such libel would be successfully defended by pleading justification. Such a plea is well known to be one of the most dangerous to plead, and one of the most difficult to sustain. We have no intention, however, of experimenting in this direction.

NO INK REQUIRED.—We have been favoured by Messrs. Mawson and Swan with some examples of the "Miraculous Pen," for which they are agents. The pen well merits its name, writing admirably without the need of ink. The pen is simply dipped into water, and is found to be at once charged with ink, black or blue, or violet or red, and writes freely. Nothing can be more handy and convenient, as we have already proved. The pen does not oxidize, is always clean and ready for use, and is suited to ordinary holders. A sample book of fashionable repp papers of different colours suggests that this firm is supplying stationery of excellent quality.

AN ARTIST'S SKETCH-BOOK.—We are favoured by Mr. J. Greer, of Pendleton, with an example of the utility of photo-

graphy in the literal reproduction of an artist's sketches. A volume of "Scrapes from an Artist's Sketch-Book," by Mr. Helmut Rothwell, contains photographic reproductions by Mr. Grear of the author's sketches in Rome and elsewhere, often made in positions where photography would have scarcely been available for producing the original scene. The pictures are often fine, the descriptions are graphic and interesting, and the photography very good.

"DESIGN AND WORK."—We are favoured by the publisher with the second volume of "Design and Work," a technical journal of great excellence. For the amateur, or practical man, whose hobby or duty brings in contact with mechanics, electricity, chemistry, machine work of various kinds, such a periodical must be very valuable; and as photographers are generally ingenious, and amateurs in various art industries, "Design and Work" will interest and help them.

SCREENS FOR REMBRANDTS.—A correspondent says:—"The slide screen I use is one described in the Year-Book of Photography, but I have covered it with blue calico, the dead side of the calico being outside. I can gladly state that I get extremely fine and soft shades with the screen, and should greatly advise other photographers to use the same, as it cuts off a tremendous lot of exposure which would otherwise be required in photographing Rembrandt heads, the screen doing away with a great amount of other screening which would otherwise increase the exposure."

BASHI-BAZOUKS AMONGST THE CHEMICALS.—The Special Correspondent of the *Newcastle Chronicle* with the Turkish army writes:—"An incident which recently occurred has caused a good deal of amusement among the inhabitants. A party of Bashi-Bazouks visited the store of Mr. Donnes, a photographer, during that gentleman's absence, and helped themselves freely to everything there was in the place. In the studio they found something which they took to be sugar, and ate freely of it. Eight of them died. Mr. Donnes was sent for by the Civil Governor, and at once admitted that he kept poison on his premises. He was then informed of what had occurred. The Governor did not even reprimand him, he probably not being particularly sorry that these troublesome fellows had been disposed of in such a way."

BLISTERS ON ALBUMEN PAPER.—The *Photographische Mittheilungen* gives the following as a very effective remedy against blisters on albumen paper:—"Use an alcohol bath, in which the pictures are allowed to remain, after the gold bath, until they have a glassy appearance; the time required is from two to three minutes. They are then dipped into water, and treated in the usual manner. This alcohol bath can be used about twelve to fourteen days, and may be used in lamps for lamp purposes, thus the cost is reduced materially."

TO REMOVE IRON SPOTS FROM MATERIALS.—This question was answered as follows by Mr. Grune, in the session of the Society for the Promotion of Photography. The spots are coloured blue with yellow prussiate of potash; wash with caustic soda, treat it with oxalic acid, afterwards washing well with water. Treated directly with oxalic acid, only fresh spots disappear.

To Correspondents.

C. S. HERRICK.—The grievance you describe seems to be really a monstrous one, if there be no unconscious error in the matter. There should be a remedy for such a wrong; but we must confess that we do not see at present in what it consists. Our correspondent's grievance should be stated as a caution to photographers generally. He sent to a presumably respectable firm, advertising in our pages, six pounds of antonised silvered paper cuttings, four pounds of chloride of silver, and four ounces of residues of gold toning bath, and received as the value of the whole the sum of fifteen shillings! The amount of silver in sensitive paper we cannot precisely estimate; but in four ounces of chloride of silver there should be three ounces of pure silver. If, instead of sending residues for unconditional sale in this way, the refuser were asked to make an assay, and from that state the worth of the whole, the same risk of disappointment would not arise. We are very sorry when any announcements in our advertising pages mislead readers; but, as we have before had occasion to remark, we accept no responsibility whatever for the statements or acts of advertisers. We could not, if we were anxious to do so, verify the statements or bona fides of advertisers: beyond their commercial dealings with ourselves, we, as a rule, know nothing of their commercial dealings or status, and bear no responsibility of any kind in relation to them.

FORST.—The use of a wash in a weak solution of alum has been proposed in America as an aid to permanency. We do not see the least reason to hope that permanency will be secured by such treatment, nor is there any evidence to show that such a result follows the use of alum. 2. The stains on the film are due to the use of a collodion in giving a horny repellent film, upon which the silver solution collects in drops, pools, and streams, instead of flowing off in an even wave. The silver solution so standing upon the plate generally makes stains of matt silver like slug tracks or oyster shells, and sometimes transparent markings, caused by the silver solution standing becoming concentrated by evaporation, and then dissolving the iodide of silver from the film on the spot where the accumulated silver solution rests. The best remedy is to use a ripper collodion, if possible, add a portion of a ripper collodion to that you are using. If you cannot do this, try adding a drop or two of distilled water to each ounce of the collodion, and shake well. Do not remove the plate from the bath until the solution flows over it without any tendency to separate into greasy-looking lines and streams. Move the plate well up and down whilst in the bath. Place wet blotting-paper at the back of the plate in the dark slide. The defect is not in the silver bath. 3. We see no reason to suppose that the use of heat in rolling or burnishing will injuriously affect permanency. It is, unfortunately, a general experience that the silver prints of the present day are not so permanent as those produced a dozen years ago; but whether this is due to less care in production, or to the inferiority of some of the materials used, it is difficult to decide.

A. BROWLAK SCHRIBER.—Tracing-hnen which is very transparent will probably answer best for covering such a screen as you desire. We are glad you find the blue screen answer. Robinson's "Pictorial Effect in Photography" is, unfortunately, out of print. We are glad you found the developer answer.

AN AMATEUR SCHRIBER (Calais).—Mr. Newton, of whose emulsion you speak, resides in New York, in the United States. If any one in this country supplies his emulsion, it will be Mr. Atkinson, of Liverpool, of whom you may enquire for it. The notices of this emulsion have been in articles reprinted from American contemporary journals. Thanks for information regarding the Apparatus Hermajis.

VINCANT.—"Pictorial Effect in Photography," by Mr. H. P. Robinson, is out of print. Should it be reprinted, it will be duly announced.

W. O. BARRY.—You will find one or two recipes in the present number which will meet your wants.

F. P. (Hensley-on-Thames).—Your letter ordering copies of the PHOTOGRAPHIC NEWS should have been addressed to the Publisher, not to the Editor, who has no duty in connection with the sale of the paper. The error in this matter caused delay in transmitting you a copy, which, however, you have before this received.

NOODLE.—We suspect that your toning bath, if (as you say it is) strong in gold, has been touched with soiled fingers, or something which has decomposed it, and rendered it inert. Touching with fingers contaminated with hypo. would do this. The toning process that went on in the hypo. was probably sulphur toning. Probably the gold solution was a little acid, and the prints saturated with it would cause sulphur toning at once on being placed in the hypo.

TRUO.—The yellow stains on the prints you enclose are undoubtedly due to imperfect fixation. As it occurs in patches, it is probable that the prints have been stuck together in the hypo, and so prevented the perfect action of the solution over all portions of the print, or the formation of air-bubbles on the print whilst in the hypo would cause a similar result. Prints should be kept moving and constantly separated whilst in the fixing bath.

H. J. M.—The office for registering photographs is in Stationers' Hall, Paternoster Row. A fee of one shilling is charged for registering each picture, and the cost of a form on which the proper details are to be written is one penny. Personal attendance is necessary. If you are not able to attend yourself, our publisher will undertake the duty for you. Send a copy of each of the prints to him, with title, &c., and 1s. 6d. in stamps for each picture, and he will attend to the matter.

B. B. S.—Received. Thanks.

CAPTAIN WATSONHOUSE.—Thanks for interesting letter. The back numbers shall be forwarded.

G. H. T.—Unless you are familiar with processes of printing by development, you will find it better to make an enlarged negative and print from that. If you prefer to enlarge direct on paper, take special care to avoid any trace of light reaching the sensitive paper or unfinished print, and use an aceto-nitrate bath. A few grains of common salt in the developer will often keep the paper white.

A. SCHRIBER.—The spots on your card have the appearance of those produced by so-called gold printing; the particles from which produce similar spots or prints. The name and address of your card is scratched was; whether it was printed with bronze or not we cannot tell. If not, perhaps the print has been amongst other cards so printed.

Several Correspondents in our next.

The Photographic News, August 3, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHIC RECORDS OF POLITICS—THE IMPORTANCE OF CONTACT IN CARBON PRINTING—THE SUNSHINE RECORDS AT THE ROYAL OBSERVATORY.

Photographic Records of Politics.—It is possible to record a great many things by means of photography, whether they be the fluctuations of light and darkness in this world of ours, the magnetic pulsations of the earth, or the temperature and pressure of the atmosphere. But we think it will be news to our readers to find that changes in the political horizon may be prognosticated by the same means. In France, just now, as everybody knows, there is a good deal of speculation as to the ultimate result of the voting which is to take place in the autumn, and the political barometer is watched every day with considerable interest. In the meantime facts reach us to show how energetically the under-currents are moving. One photographic firm alone in this capital is executing an order for no less than thirty thousand Prince Imperials, which will, we suppose, be circulated throughout the country in the interest of Imperialists; while Republicans, on the other hand, are distributing pictures in abundance in the cause of MM. Thiers and Gambetta. The latter party do not confine themselves to photography, and an order has been received by one of the London comic papers for an almost unlimited supply of one of the cartoons recently published, which had a Republican tendency. No doubt, if we were to enquire nearer home, we should be able to deduce a very sound result as to the popularity of this or that political leader by the demand for his portrait among photographic dealers. Earl Beaconsfield, especially after the vindication of the Stationery Office appointment, would probably be in considerable demand just now, while after the atrocities of the Russians in Bulgaria we should possibly find a falling off in the demand for pictures of those statesmen who have lately been espousing the cause of the Muscovite. Many may think it a matter of little moment whether a shopkeeper sell a dozen or so of one portrait more than another, but when we hear of a supply of thirty thousand pictures being made by one firm alone, it is not so insignificant, after all, whether regarded from the producer's point of view, or the influence which such pictures have upon public opinion. There cannot be a doubt, for instance, that if one morning all London woke up to find the portrait of a certain individual staring at them from the windows of every photographic dealer, that individual would have become famous before night had fallen. Many persons, both of high and low degree, have had their popularity infinitely increased—nay, altogether created—in this way; and one of these days we shall have photographic publishers besieged by individuals thirsting for publicity in the same way as editors of influential newspapers are. *En revanche*, we know many a photographer owes a good deal of his income to such publications, and we could name three or four, forsooth, who have made a nice little fortune out of the portraits of one individual or another. If only statistics could be collected of the number of copies of different portraits sold every year, how interesting they would be to read!

The Importance of Contact in Carbon Printing.—There is one point in connection with carbon printing which deserves attention, especially at this season of the year, when the tissue is apt to get stiff, if not horny and brittle, by lack of moisture. It is this: that without very particular care on the part of the printer, there will be want of contact with the negative and tissue. Ordinary pressure, such as will serve to maintain a piece of limp albumenized paper in close contact with the cliché, is of no

avail when printing small pictures in carbon. Unless there is absolute contact all over the surface in such cases, it is next to impossible to get a sharp picture. In winter it may be done, for then there is plenty of moisture in the pigmented gelatine, and it presses flat without difficulty; but with a thick and horny substance, as the tissue is frequently in summer, far more pressure than usual is absolutely necessary. The tissue may have a glazed surface imparted to it from being partially dried upon a patent plate after sensitizing, and this helps matters a good deal; but even in this case, when small and delicate cartes-de-visite are to be printed, considerable care must be taken. Another point, perhaps hardly less important in connection with carbon printing in bright summer weather, is the screening of the fresh tissue from light. It was customary during the early days of carbon printing to have quite a contempt for diffused light, and the work was carried on in a well-lighted room, the tissue, both exposed and unexposed, being contained in table-drawers in the same room. Such a *modus operandi* is, no doubt, all very well in winter and in cool, dull weather, but in the summer time, when a chance ray of light does twenty times more mischief than at other seasons of the year, and when the dry air around robs the tissue of every available particle of moisture, matters are different altogether, and it behoves the printer to be far more careful of his materials. It is impossible to secure pure whites under such circumstances, and, moreover, reticulation in the tissue will not be long in showing itself, if better care is not taken to prevent it from the hot, dry air.

The Sunshine Records at the Royal Observatory.—It has been the custom now for some months past to observe the weekly duration of actual sunshine at the Royal Observatory at Greenwich, and last week it was reported that out of 112 hours during which the sun was above the horizon, it only shone for 37·8 hours at Greenwich. A dull week, certainly, for photographers, it would appear, and yet such was far from being the case, for the fact is that in this summer weather bright sunshine is rather in the way than otherwise. Unless it is a question of black and white printing, photographers do not care to expose their negatives in the sun, and for most purposes the sun behind a thin veil of cloud is to be preferred by photographers to the blazing sunshine itself. In truth, not only for photographic purposes, but for most other things, it would be far more to the purpose, we cannot help thinking, if the authorities at Greenwich, instead of telling us the total number of hours during which the sun appeared from behind the clouds, were to inform us of the total amount of light shed upon the earth during the week. Many would have a difficulty in saying what is sunshine and what is not; whether the time during which the sun appears bright and bare in the heavens only should be counted, or whether the whole period should be timed during which shadows are cast by the solar orb. There should be no difficulty, with the scientific appliances now at our disposal, to record the actual intensity of the light from time to time, and in this way a total might be arrived at showing the value of the rays (in degrees) that have reached the earth within a certain period. Were this mode of record adopted, there would be no difference of opinion as to what is sunshine and what is not, and for the sake of the uninitiated a statement might be made that the number of degrees of light registered during a week is equivalent to so many hours of pure noon sunshine—say on Midsummer's Day. A light register of this kind would be of considerable value, not only to the photographer, but to the farmer, the agriculturist, the mariner, and others who make some study of the rainfall and other meteorological records. Indeed we do not see why the Royal Observatory at Greenwich should not supply us with both kinds of record.

INVESTIGATION OF ARTIFICIAL COLOURING MATTERS.

SUITABLE AS ANTI-PHOTOGENIC AGENTS—A SUITABLE DARK-ROOM WINDOW FOR BROMIDE OF SILVER PREPARATION.

BY M. CHARLES BARDY.*

THE interesting emulsion process of M. A. Chardon requires that in the preparation of the material no light should be admitted having an action upon bromide of silver. I may, therefore, be able to render some service to those who occupy themselves with the process, by pointing out an easy method of replacing the yellow glass in their dark rooms, which permit a large quantity of the actinic rays to pass.

For the past two years I have made a study of bromide of silver in dry processes, and I employ, for the purpose of intercepting the light in my laboratory, sheets of glass tinted with colours derived from coal tar. Among the substances which I have tried, one possesses in a high degree the property of arresting active rays, and that is chrysoidine. Chrysoidine is a yellowish red colouring matter, and is made in England. It is a crystalline substance, soluble both in water and in alcohol. This property permits of its use in different ways; namely, as a varnish, in collodion, in a solution of gelatine, &c.

To make a varnish with chrysoidine, it is sufficient to dissolve it to the point of saturation in any alcoholic varnish, to permit the liquid to cool, and to filter it. The varnish is then employed in the ordinary way. By replacing in the preparation of collodion the alcohol, by a saturated alcoholic solution of chrysoidine, a very highly tinted collodion may be secured. As the ether, when the saturated solution is added, will precipitate some of the chrysoidine, it is well after mixing to allow the collodion to stand awhile, and then to decant it.

Either collodion or varnish prepared in this way and applied to glass will serve as a substitute for yellow glass, and is better than the latter in the preparation of bromide of silver. In some cases it is well to coat both sides of the glass with the liquid. One of the best ways of employing the chrysoidine is, to put it into pellicles of gelatine. The following formula will give some idea of the proportions to be employed:—

White gelatine...	...	...	20 grammes
Water ...	...	...	125 cub. cents.
Chrysoidine ...	...	...	2·5 grammes
Glycerine ...	...	...	3 cub. cents.
A two per cent. solution of alum	40	..	

You commence by dissolving the chrysoidine in the 125 cubic centimetres of water, warming the latter to facilitate solution; the liquid is then filtered and allowed to cool, and you proceed in the same way as when making gelatine pellicles by M. Jeanrenaud's method, namely, by pouring upon a glass plate. It is well to make the pellicles as thick as possible, and to do this the glass plate is rubbed with talc, and after it has been collodionized the margins all round are rubbed with soft wax, so as to form a border. In this way a sort of tray is formed, into which the gelatine is poured. A levelling stand is employed to rest the plate upon, and it remains in position until the gelatine has set. Afterwards the film of gelatine is covered with collodion containing castor oil. In this way a very supple pellicle is secured of a red ruby colour, which, if properly prepared, prevents the passage of all actinic rays.

An excellent anti-photogenic paper may be made by impregnating strong paper with a solution of:

Chrysoidine ...	...	...	3 grammes
Alcohol ...	...	...	100 cub. cents.
Water ...	...	...	50 ..

This paper does well to intercept light in laboratories, to envelop articles sensitive to light, prepared plates, dry emulsion, sensitive collodion, &c. It is preferable to all

papers of the kind met with in commerce, and it is likewise very cheap, for the alcohol may be replaced by methylated spirit, or suppressed altogether; in the latter case, it is only necessary to see that the solution is kept very warm when the paper is immersed in it.

Eosine, a magnificent colouring matter, is equally soluble in water and alcohol, and it may be employed in precisely the same way as chrysoidine. Its colouring capacity being inferior to the latter, however, it is necessary to take at least double the quantity of eosine when employing it for the purposes indicated for chrysoidine.

I was led to use these two substances after a series of experiments which I conducted to ascertain the absorption bands produced by various derivatives of coal tar when examined under the microscope, and I may here cite some experiments which demonstrate the role which the spectroscopy may play, in studying the actinic properties of colouring matters.

1. Fuchsine or aniline red. This substance, the oldest and most generally known, presents a most characteristic absorption band; it is situated in the green part of the spectrum. If the micrometer of the spectroscope is so regulated that the division 100 coincides with the yellow sodium ray, and if subsequently there is interposed between the luminous source and the slit a small transparent vessel filled with a dilute solution of fuchsine, there will be seen a soft band covering the whole of that portion between the divisions 110 and 125 of the micrometer. By adding more and more of the colouring matter to the solution, so as to deepen this considerably, the band of absorption becomes more pronounced, and broadens both right and left, covering even the yellow sodium line, and in the end only permits the orange and red rays to pass, as also a portion of the violet.

This substance cannot be without influence upon the sensitive preparation of silver; the fact that, when very concentrated, the solution permits some of the actinic rays to pass, proves this in fact. A pellicle of gelatine, strongly coloured with fuchsine, interposed between the light and a film of Chardon emulsion, and covered with a negative, serves to produce a positive image in fifteen seconds in diffused light.

2. Naphthaline rose possesses a band of absorption situated between the divisions 120 and 145; the deep colour of this product appears to intercept all rays with the exception of orange and red. Although the eye cannot perceive the violet rays, it is evident that the band on spreading cannot cover all the spectrum, and that a portion of the violet rays is not absorbed. Naphthaline red associated with gelatine gives under the circumstances previously described a positive image in sixty seconds.

3. Eosine presents similar characters; the band of absorption in this case is not quite so broad, and it is situated between the divisions 120 and 140. In default of other substances, these two products, employed in the form of very deep solutions, may be made to give satisfactory results.

4. Chrysoidine has this particular trait—that it has no visible absorption band. If there be interposed between the source of light and the slit of the spectroscope solutions more and more charged with colouring matter, there will be perceived a sort of screen, which, starting from the violet, approaches, little by little, towards division 85 of the micrometer. From this moment, no matter what the concentration of the solution may be, the screen advances no further; but the intensity of the red and orange rays still diminishes. This manner of behaving itself leads one to think *a priori* that chrysoidine must fulfil in the most perfect manner the role of an anti-photogenic agent, and experience has shown such to be the case. A plate prepared with the Chardon emulsion, placed five minutes behind a glass covered with gelatine tinted with chrysoidine, gives no trace whatever of an image with alkaline development.

* Read before the French Photographic Society.

Under the same conditions an ordinary yellow glass will yield a positive image with an exposure of twenty seconds. And yet this yellow glass, which gives an image thus with bromide of silver, I have used without detriment for the glazing of my dark room when working the wet process. In examining this yellow glass with a spectroscope, it will be found that it does not intercept any of the rays of the spectrum; it simply weakens them.

It has been stated in the *British Journal* that an anti-photogenic screen may be produced by covering a glass with a solution of gelatine, and when this is almost dry, treating the same with a concentrated solution of permanganate of potash. We have examined plates prepared in this way with the spectroscope, and while they have appeared exceedingly opaque, they nevertheless allow the whole of the spectrum to pass, more or less weakened; in a word, these permanganate of potash plates behave in the same way as the yellow glass of which I have just spoken. Photographers will, therefore, do well to be very circumspect how they make use of the process.

We do not wish to affirm that substances to which we have referred will secure the most perfect immunity; we only say that they are more than sufficient to protect bromide of silver emulsions, and they will allow the photographer to work without being troubled with fog.

Artificial colouring matters being easily attacked by light, no doubt many will have their suspicions as to the durability of some of these colours. We are in a position, however, to state that there is no need for any misgivings on the subject. For upwards of a year I have had the window of my dark room glazed with a sheet of glass covered with chrysoidine collodion. Now, this substance has preserved to this day its anti-photogenic power, and serves for a screen against the light when preparing the bromide of silver films, as well as when first placed in position. And yet I may mention that, during the whole twelvemonth that the window has been in use, it has had sunshine upon it for some hours every day.

WASHED EMULSION.

BY JOHN C. BROWNE.*

About a year ago I made a photographic trip through Pike County, Pennsylvania, and on my return prepared an account of the expedition. Upon that occasion I used wet plates only, but the labour of transporting my outfit was so severe that I determined not to use a wet apparatus again in such a rough locality, if it was possible to depend upon any dry process.

During the past winter my attention was called to a sample of washed emulsion, prepared by Mr. Lewis P. Young, of Philadelphia, which gave good results in quick exposures, but a longer time was sure to spoil the negative by solarization, unless the plate was backed. This fault was so annoying that I had almost given up the idea of my contemplated Pike County trip this year, when Mr. Young handed me a sample of stained washed emulsion which he modestly said would not trouble me with solarization even in very long exposures. I tried the article, and the result far exceeded my expectations. In a few weeks I became quite expert in the development, and made arrangements to test its capabilities upon ravine views.

After some delay, Mr. Young agreed to accompany me, and we started for the Delaware Water Gap, where we joined Mr. Graves, who carried a complete wet outfit. For two weeks we rambled over a portion of Pike and Monroe Counties, going to many localities not visited before, and to all the best known objects of interest. The relief from the labour of carrying the heavy load necessary for wet work was an agreeable experience. We had no difficulty in going anywhere unassisted, and enjoyed the trip from beginning to end, having a large number of good negatives to show as the result. My own judgment might be considered at fault

* *Philadelphia Photographer.*

if I were to express myself as I feel in regard to the quality of the negatives, but I will say that some of the most critical judges have examined the work and pronounced it excellent. The time of exposure varied from a few seconds on bright subjects to considerably over an hour on dark ravines. The development was under perfect control, and proceeded almost as rapidly as a wet plate. No solarisation or fogging was noticed. I have been asked if the result with stained emulsion compared favourably with the wet collodion process, and I have answered that almost all the negatives made in Pike County are nearly in quality to wet plates, and a few superior, owing to the great latitude in exposure.

For the future, in making extended excursions with the camera, I shall discard my wet traps, and substitute a dry outfit. Mr. Young has cause to feel well satisfied with his success upon this occasion, and in the opinion of the writer richly deserves the thanks of photographers for placing in their hands such a valuable article.

A NEW GOLD SALT FOR TONING.

BY DR. J. SCHNAUSS.

UNTIL now there have been used only the single and double chloric salts of gold for toning. During the past winter Mr. Neumayer, student of chemistry from Munich, visited my establishment, and undertook under my directions the preparation of a gold bromide and a gold bromide of calcium, for the purposes of experimenting with these salts and their uses in photography.

Thin leaves of gold are readily dissolved in bromine water and in bromine gas. But a more rational and less disagreeable mode of preparation is by the action of hydrobromic acid, nitric acid, and aqua-regia.

During the evaporation of the gold bromide, which has a dark appearance and smells strongly of bromine, great care is necessary, owing to the fact that the gold bromide vaporizes more easily than the chloride. Bromide of gold is difficult to crystallize. By the addition of an exact equivalent of bromide of calcium dissolved in water, and evaporated, small granite-red crystals of double salts are obtained. $\text{KBr} + \text{AuBr}_3 + 5\text{H}_2\text{O}$ can be with difficulty dissolved in water; but a thin solution is of a deep red colour, and effloresces in dry air.

I have tried these double salts, also the gold bromide, with several additions, as a toning bath. In its general effects on silver copies it is analogous to gold chloride combinations, except that in the same proportions it acts more energetically.

The addition of soda bicarbonate gives a blue-black tone, melted acetate of sodium a purple-coloured tone.

For a lasting gold bath, in form of a *sel encausse*, these salts are recommended.—*Archiv.*

HOW TO TRANSFORM A SIMPLE PHOTOGRAPH INTO A PRINTING BLOCK.

In the *Photographisches Archiv* appear the details of a simple method of securing an outline photograph in metal suitable for printing with type in the ordinary printing press. It is necessary to be somewhat of a draughtsman, no doubt, in order to be able to do the work well and rapidly, although nothing is said on this head, but hardly any one could, haphazard, undertake the matter.

Only a well-marked photograph with bold lines, and in which minor details are of no account, is suitable, and the negative is in the first place put into a camera or other apparatus to furnish an enlarged positive. Upon this enlarged positive are traced, in Indian ink, the bolder lines which it is desired to retain, a pen or brush being employed for the purpose, according to the nature of the work or the desire of the draughtsman. After all details have been in this way traced, with thoroughly black pigment, the lines of a thickness corresponding to the original

object, and of such a nature as to be readily reproduced by photography, the print is treated with chloride of lime or other bleaching agent, and in this was the whole of the image obliterated with the exception of the black lines made by the draughtsman.

The picture is now photographed, and in this way a small negative secured, or one, at any rate, of the dimensions of which the printing block is to be. In this case the negative will be perfectly opaque in the lights and transparent in the shadows, and from it may be easily produced by any of the etching processes an engraving upon zinc capable of being used in the printing press with type.

Chloride of lime is specially mentioned as the bleaching agent wherewith to render invisible the details of the silver image, after the draughtsman has done his work. We should think that a solution of bichloride of mercury would be much more effectual in making the original photographic image disappear.

ART CONSIDERATIONS IN POSING THE SITTER.

BY M. A. ROOT.*

PHOTOGRAPHY is justly entitled to rank as one of the fine arts, and to excel in its practice requires genius quite as imperatively as excellence in painting or sculpture, architecture or music. Without such genius as operant, however skilful in manipulating and in the merely mechanical accessories of his profession, can never be higher of other than a simple mechanic therein—that is, however handsomely finished, his pictures may be, they must ever want that life-likeness, as that expression which announces the individuality and personal identity of their originals.

Let me not, however, be understood as underprising great care and skill, coupled with the utmost attainable finish in the accessories above named.

According to the familiar adage, a complete man should have "a sound mind in a sound body." Not less imperatively should a perfect photographic portrait combine a vivid expression of the sitter's soul with the utmost finish in the representation of his person.

I regret to say that numerous photo-artists are exceedingly defective in the mechanical appliances of the art, as well as in a point more important still. How, in fact, could it be otherwise, when from the urgent press of competition, the "cheap system" has intruded into this as well as into all other vocations, "sacred or profane?"

The "go ahead," hurry-scurry movement of our American life is bitterly hostile to high excellence here, as well as everywhere else; for it is manifestly impossible to expend much care and time—even where ability and skill are not wanting—upon pictures which are vended for but a trifle more than the cost of materials used.

The public, it should be frankly and boldly stated, are very culpable in this regard. Precisely so long as they prefer and insist upon having cheap wares, such cheap wares will be promptly furnished to their order, but their intrinsic value will invariably keep even pace with their cheapness. In order to procure a first rate article, whatever its kind, a liberal pecuniary compensation must be paid, since, by a sad but inexorable necessity, artists are absolutely compelled to eat and drink, to wear and house, exactly like the "rest of mankind." Enough on this topic.

Let me remark, however, with the utmost emphasis, that however important may be the mechanical "getting up" of a picture, there is one thing more important still—so important, indeed, that, where it is lacking, a portrait is virtually no portrait at all of a living creature, but, to say the very best of it, the faded representation of a lifeless being. In the "one thing" mentioned, I allude of course to what I have named "expression," a term whose signifi-

cance is so well known to my readers, that they need no explanation of it from me.

As I mentioned above, to communicate this "expression," whether produced by the sun-pencil or any other pencil to a portrait, be it of man or be it of nature, genius is indispensable.

Does my reader ask what I mean by this term "genius?" My inevitable reply is, that I—however it may be with the wiser sort—am wholly incapable of confining that subtle essence within the boundaries of a verbal definition. Its effects, however, I, like all others, can recognize at a single glance. So far as I can comprehend it, it would seem to be a faculty originally bestowed by the All-Creator—susceptible, indeed, of being developed, improved, and exalted immeasurably—but by no possibility to be acquired by one in whom its germs were not implanted at the first.

It acts in ways and towards issues which not even its favoured possessor can explain to others, or even to himself. As simple matter of fact, however, he is qualified to perform by a seeming intuition, and on the instant, what those otherwise organised are unable to do by the most laborious and protracted effort.

It is the Divine Agent, universally, in discoveries and inventions in all spheres.

In the fine arts, however, its agency is absolutely indispensable. Without its unmistakable presence, they are not fine arts, but coarse arts. All, therefore, who are not vividly conscious of possessing this magic gift—be their general abilities and talents as ample and as various as they may—would act most wisely in eschewing all endeavours to master and practise these arts.

Not for a moment, however, would I counsel them to let such abilities and talents lie idle. 'Tis to act were treason to their own endowments, to say nothing of ingratitude to the munificent Giver of the same.

But surely they may readily find innumerable spheres in this topsy-turvy world to which their peculiar powers are specially adapted, and by labouring in which they may acquire a grand and spotless fame for themselves, while they render essential service to their race. In this sphere, however, among the fine arts, they are, most assuredly, "not at home."

Now to the portrait poser, the art student, possessing natural genius, who should have the sole control of the sitting department and management of the camera, I would offer some suggestions as to the means to be adopted by the photo-poser to overcome the difficulty arising from the rapidity with which the sunbeam acts upon the plate.

The portrait painter (as I have said in former articles) may have several sittings, each lasting for an hour or more, and thus have time to learn what is his sitter's most characteristic expression—or, perhaps, to call up that expression by his conversation and personal influence.

The photo-artist has his sitter with him but a few minutes, or it may be seconds, and even then the circumstances are such as not to be very favourable to producing in the sitter's mind the mood which will give his face and figure the best expression. What can the sun-painter do to counterbalance these disadvantages? As I have said more than once before, he must have genius as a *sine qua non*, for this will not only spontaneously suggest various expedients to be used, but it exerts upon those coming in contact with it a kindling, genial influence, which can be neither analyzed or defined.

But genius, without the cultivation which supplies it with materials and implements, can accomplish little. Let us note, then, some of the means to be used in effecting the end alluded to.

In the first place, then, the ambitious and would-be successful photographic art poser should have his rooms and studio so arranged as to act favourably on his sitter's mind, prior to, as well as during the sitting. It will be

* St. Louis Practical Photographer.

understood, without my going into detail, that he should fit up his rooms with artistic taste, having therein books, pictures, engravings, sculpture, &c., of a kind to attune the visitant's mind to the mood he would wish to express in the portrait to be taken.

In furnishing of the apartments, &c.—in short, all of the items of equipment—should be regulated with a view of awakening in the visitants the best and highest thought and feelings.

If I were speaking to common-place, prosaic persons, I might expect ridicule in requital for these remarks. But you, Mr. Editor, and your readers generally, I trust, have sufficient knowledge of human nature—or, in other words, philosophy—to know that we are very much in character what the circumstances about us have moulded us to be. The dark or the bright, the black or the white around us, cast their peculiar shadows upon our minds, whether we be permanently or temporarily under their influence. As the end we are supposed to be aiming at is to get from the sitter his best expression, and as all surrounding circumstances operate in one way or another to affect the mind—whence the expression comes into the face and figure—let us make all he sees or comes in contact with, in the heliographic studio, tend to produce upon him the influence we desire. I need not enlarge, or go into details upon this subject, since those who can understand it at all will understand it at once, and fill up the outlines here given from their own minds.

The previous preparation having been made, we now come to the time of sitting itself. And here, as I have repeatedly intimated, a momentous task falls upon the artist who would get a portrait expressing the best and highest phase of the sitter's character.

I might fill many pages with a detail of what experience has taught me in reference to the position the model (sitter) should be required to assume—the mode in which the light should fall upon his face and figure, so that blemishes may be alleviated, and good points brought distinctly into view.

In short, a thousand things respecting the configuration and locality of the sitting-room, the windows through which the light comes, &c., all of which myriad particulars bear directly and essentially upon the fact whether a mere mechanical transcript, or a mimic life reduplication of the sitter, at his best, is to be obtained.

It seems to me strange that in all the numerous and excellent treatises on our art, scarcely the slightest attention has been given to the subject, which is by far more important than any other—that is, the means to be employed for getting the sitter's best and individualizing expression—his living, thinking, feeling self, instead of a face and form which make us

"Start, for soul is wanting there."

At present, however, I must restrict myself to a few words on a single point—the action of the artist upon the sitter at the moment of taking.

The photographic poser should possess certain conversational powers, together with a certain kind of manners and deportment, whereby he can adapt himself to his sitter—whoever and whatever he may be—with such effect as to call up in such sitter his best and most characteristic moods; or he should instantly quit the position at the camera for some very different employment.

You will find, in looking over the biographies of all who have been distinguished in portrait-painting, that they have uniformly been distinguished by their powers of conversation. To possess such powers demands, first, original genius—involving a ready sympathy with persons of all temperaments and characters; and next, an assiduous cultivation of such genius—a cultivation which puts one in possession of all those myriad methods, both in the way of solid and of graceful, whereby the hearer's mind is aroused and his heart set all aglow.

Therefore I would say that the photo. art-poser who

would be truly such—who would do honour to his profession, and not do discredit to that bright orb who lends his luminous pencil for his work, exacting nothing in requital but a fitness for the profession assumed—must know at the outset that he possesses a conversational capability, and then must cultivate such capability to the highest possible degree.

I need not specify how he is to do this—his own spontaneities will prompt him. It is, however, obvious upon the surface that a fair acquaintance with books of the rarest quality is one important item for such culture.

But more important still for him, as, in truth, for all men else, it is to observe—observe all men, of whatever class or character, with whom he comes in contact—observe them, too, with that genial, humane feeling which so acts upon all coming within its sphere as to summon into activity whatever is best and noblest in them, and to bring into view that imprint of the Divine Original and Sire which is stamped on every soul, though often hidden by the rubbish of worldliness, or covered by the black fetid waves of illicit passion and appetite.

Thus mingling with men of all degrees and qualities, the photo. poser learns how to approach and commune with all—and thus is able to act upon his sitter, both by his conversation and his mere personal presence, as to bring out the expression desired.

TRIMMING PRINTS BEFORE TONING AND FIXING.

MR. JOHN L. GRIMON has the following remarks in our Philadelphia contemporary:—

"The cutting of a print after it is removed from the pressure-frame, and before it is toned, cannot, I think, be too strongly advocated. There is every reason in favour of the plan, and none against it that I know of, except an occasional plea of want of time. I was myself much prejudiced against so flagrant an innovation upon time-honoured customs until observation and an experience as to the economy of the measure made me realize its advisability.

"The clippings from the edges of prints, no matter how inconsiderable they may be when singly considered, become really valuable when weighed by the pound. The pennies that are inconsiderately thrown away would be the making of dollars if gathered together.

"No smaller an item is the economy of gold in the toning process, and, contrary to the preconceived ideas of the uninitiated, there remains the lessened liability of damage to or the tearing of the print during its manipulation. The clear cut edge is a great protection to it. Otherwise, if it is desirable to dry off your pictures before mounting them, it is necessary either to hang them up, to lay them upon covered stretchers, or to place them between heavy blotters or cloths.

"The last plan was the one most generally adopted by the 'Company.' It had the advantage of preserving the pictures well straightened out, and thus rendered more adaptable to the Robinson 'trimmer' or Bergner cutter. Care must be taken that the blotting-papers or cloths are kept scrupulously clean, and an occasional test might be used for the discovery of any trace of soda contained in the former, and the latter should be washed frequently. It is often averred that the blotting pads as they are received from the paper-makers or stationers are already contaminated by soda used in their manufacture. Frequent experiment has, in my own case, failed to detect its presence.

"Even in this apparently minor part of the business more care should be used than an untrained lad generally feels incumbent upon him. The dropping of a print upon the floor, or the use of a dirty clothes-clip, or a soiled paper, will most undoubtedly be ruinous to the photograph. In short, an artist's anxiety about the welfare of his productions is never at an end—no, not even when they are lost to his sight, and become the property of his customers."

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LIGHTING THE FIGURE.

PROBABLY every portraitist is well aware that lighting the sitter is a matter of great importance in photography; but it has probably occurred to few to remember that it is the matter of primary importance in the presentment of a portrait. Outline may of course indicate a form, without light and shadow; but the only mode of presenting the image of an object in a solid form is by means of light and shadow, and it is on the proper arrangement and gradation of light and shadow that truth in delineation as well as pictorial beauty depends. The skilled master of light and shadow produces the truest and most natural looking of portraits, as well as the most pleasing and effective pictures. Hence, although the subject has often received attention in photographic literature, it can never receive too much attention; its principles can never be too much enforced, nor can they be too assiduously studied.

During the last two or three years many portraitists have been in the habit of receiving advertising circulars announcing the publication of a pamphlet on a system of lighting by Mons. Klary, a photographer of Algiers, and rumours of the system discovered and described by the Algerian portraitist have reached many who have not seen his circulars. The first thing noticeable in these circular announcements was the enterprise of the thing. Each circular consisted of two or three sheets of closely printed matter, and the names of most of the distinguished photographers in Europe appeared in connection with testimonials as to the value of Mons. Klary's system. The original price of the pamphlet was, if we remember rightly, two hundred francs, equivalent to £8 sterling. After a lapse of time it was reduced to one hundred francs, and finally to fifty francs, or £1, the price at which it is now offered to photographers. The price seems and undoubtedly is, high. But we think it is very probable that the work has proved worth the money to many, as it does beyond a question contain valuable instruction and advice, and the fact that the price was high will in many cases probably enforce more attention to this instruction than if it had been obtained at a low price. Some time ago our esteemed correspondent, Mr. Charles Waldack called attention to the pamphlet, and explained in our pages that the system resembled that described by Mr. Carl Meyer, in America. The system is one which we have often brought before our readers, and advocated. It is mainly dependant on the use of portable screens for reflecting or intercepting the light, so as regulate and direct the proportion and position of light and shadow. An article we wrote and published precisely three years ago will interest some of our readers if they refer to the eighteenth volume of the News.

Regarding the aim of M. Klary to improve the pictorial character of photography as worthy of approbation, we have not hitherto felt it fair to epitomise or make extracts from his pamphlet. As we find this has already been done in some quarters, we feel now the less hesitation in giving some account of the contents of the brochure, without still wishing to interfere with its chances of circulation. In an interesting opening chapter on the importance of light, in the course of which we are pleased to note that M. Klary has studied Mr. H. P. Robinson's work, we find that the author condemns the use of much side-light, by which he says "the beauty of the eyes is seriously threatened, the natural shades of the face are partly destroyed, and the features appear distorted, feeble, or unvigorous. The mouth, that part so graceful and essential of the head, in a woman, the mouth, round which so many feelings are playing, loses nearly all its charmingness; the slight shades which stamp its corners disappear; the upper lip is nearly as light as the lower lip. The shade which should be showed under the latter does not exist, and in many cases the whole becomes white, as far as a thing can be white and still maintain some appearance of shape." As in our experience the most satisfactory portraits have been produced in studios with abundance of side-light, we may here point out an omission in M. Klary's estimate of the case. A top light undoubtedly most readily lends itself to force, and to striking pictorial effect; but it is the side-light which gives natural and satisfactory portraits, and that because it is that lighting under which we usually see the faces of our friends. The windows of ordinary rooms are side-lights, and this is the light which is most common and familiar. A high side-light answering to the upper part of an ordinary window generally gives at once a natural and pleasing portrait if used with anything like judgment.

M. Klary proceeds in his next chapter to insist on the balance of light, so that the lightest part of a face shall not be white, nor the most shadowed part black. He remarks: "There are three sorts of lights in use for the production of photographic pictures: the diffused light, the direct light, and reflected light. The diffused light is that which is employed in largest quantity; the reflected light is that which must be more restrained. A diffusion of light on the whole face makes it appear flat and unvigorous. It is then that the direct light comes to our help in lighting the prominent parts of the face; but it is necessary to employ it judiciously, understandingly, and in small quantity. In order to be really useful the side light must be taken on a level with or above the horizon. The most competent artists agree that the best light is that which falls on the sitter at an angle of forty-five degrees. The relative proportions are never to be, in any case, a matter of chance or accident." The fault in lighting which is most common, and which M. Klary most deprecates, is flooding the sitter with too much light, to the destruction alike of texture, modelling, and pictorial effect.

In another chapter the author proceeds to examine the various modes of controlling light which have been proposed—not simply the ordinary methods of using curtains, &c., but the reflector and counter reflector of Kurtz; the alcove background of Adam-Salomon, first published in our pages; a movable room, proposed by a Hungarian photographer, M. Gondy; and the hand-screen of Kent, which he considers the starting point of his own system. We may here remark, that we have no doubt that the system of lighting with the use of screens has been worked out by M. Klary for himself; but he scarcely appears to be aware that the use of portable screens for controlling the lighting of the sitter is a very ancient device in photography, in common use amongst the early Daguerreotype artists. It has, singularly, and unfortunately, as we think, passed out of common use; but we hope will be, with M. Klary's aid, revived again. A study of his system,

with the diagrams given, will have the effect, we think, of inducing many at least to give it a trial.

Without the use of M. Klary's diagrams we could not well explain his method of using translucent screens for softening light, and opaque screens for reflecting light; and we must take leave of his pamphlet, therefore, by stating that the subject is treated with much intelligence and earnestness, and will well repay perusal. But we may add here, in relation to the subject, that Mr. Cussons, of Southport, who some years ago commenced the manufacture of portable screens for governing light, has recently further developed the matter, and supplies screens on the plan adopted by M. Klary, of Paris, of whose pamphlet a synopsis is given in a circular recently issued by Mr. Cussons. As this is very well done, we reproduce part of it for the benefit of our readers. The circular proceeds as follows:—

"Light and shade giving us all our effects, our ability consists in using both in such proportions that we obtain at will the most varied effects. The top and side lights together are generally adopted in the construction of photographic studios; but it is in the injudicious use of the latter, especially when employed in too great a quantity, that many fine effects are lost, and the resulting picture is rendered flat and feeble, the natural shades of the face destroyed, the features distorted, the eyes, the mouth (the upper lip especially) shorn of their full expression, and the whole face wanting in graceful and natural relief. For heads and half length portraits it is quite unnecessary to use the side light in so large a quantity as is usual; the top light, when under judicious control, will give the better and more artistic effects of light and shade. In order to be really useful a side light must be taken on a level with or above the horizon; the best light is one that falls on the sitter at an angle of 45°. It is necessary that the light be balanced in accurate proportion, the time of exposure sufficient to set forth the lighting, and the development adjusted according to the exposure. The lighting of the face should be balanced in such a way that the contrasts may not be simply black and white, but a soft gradation of all the intermediate tones, as well in the lights as in the shadows, so as to produce a graceful and artistic picture. There are no pure whites to be depicted in the human face, though there are some portions which may be nearly so; the whole face should be more or less shaded, and some luminous touches be slightly thrown on the most prominent parts; the greatest distance from the eye of the beholder should be darkest in tone,—the nearest portion the lightest, and every gradation between.

"Of the three lights used in the studio, the diffused may be employed in the greater quantity, the reflected must be more restrained, and the direct used more sparingly and judiciously. The position of the sitter should be under the principal or strongest light. It is best to employ a soft and slightly diffused light, combining in due proportions the top and side. This is readily obtained by use of the head screen (which, being constructed with various movements, will enable the operator to have this light under perfect control). It should be placed by the side of the sitter, nearest to the light, and of course outside the focus of the desired picture. It must be elevated above the head, raised or lowered and turned to the required angle until the operator observes the true and best effect upon the shades and lines of the face. There will now be seen a general and diffused light over the whole of the figure, but a little predominant on the side nearest the light; then open a small accidental side light quite in front of the sitter, which will fall upon the prominent parts of the face; if the eyes are sunk deeply, lower the screen a little, and move it slightly towards the shaded side of the face; it will thus increase the top light, and bring the face into bold relief; the shaded side, though slightly darker than the other, will remain soft, and full of detail.

"Observe that the reflex of the eyes must be the same in each: these luminous points have their place on the upper part of the eye, and nearest the side light—not in the middle. If the reflex appears in one eye only, the face is too far away from the side light; then move your camera and turn the face towards the side light until these luminous points appear on both eyes; the head will then be well lighted, and the classic outline of the nose well rendered. A beautiful and often unforseen lighting will be discovered by the movements of this screen. Being made of translucent materials, it softens, filters, and slightly diffuses the light over the head of the sitter, and is an immense power in the hands of a skilful operator for obtaining in any studio those fine effects of light and shade which produce a perfect picture, and which could not be easily produced by any existing arrangement of blinds or curtains. With taste and a little practice its use will become intuitive.

"It is necessary to soften the edges of the shadows, in case of need, with a pure and delicate reflected light; this is done very readily by means of the concave reflector, used in accordance with the judgment of the operator. It should be turned towards the sitter in such a manner as to throw a concentrated light upon that part of the face under and behind the eye, as well as the darker portions of the neck, and you will thus avoid the spot of reflected light appearing in the eye. A perfectly exact position of the reflector is as essential as for the head screen, in order that the proper balance of lighting may be obtained.

"For lighting *a la* Rembrandt do not change the position of the face, but move your camera so as to obtain a view of the other cheek, and, with some slight modifications of the head screen, this lighting will be as perfectly rendered as the other; it is not here necessary to use the reflector; the head screen alone will regulate the top light, which must be used sparingly, so that it does not fall upon the points where the middle tones are wanted.

"It is desirable in all studios to provide some object upon which the eyes of the sitter may be directed, and rest easily, at the point of vision selected by the operator; for this purpose we make a small stand upon which is mounted an object to be raised or lowered at will, and fixed at any given point. The semicircular or alcove background of M. Adam-Salomon will prove a most valuable adjunct in a studio sufficiently large to admit of its free use; for by it we obtain the true effects of light and shadow in proper contrast with those of the figure; and hence the subject is brought out in bolder relief than it would be with a plain, flat background. But in ordinary rooms, where the space is so restricted that an alcove background could not be advantageously used, we should recommend a flat background, graduated from top to bottom, from light to dark, and these, if artistically painted, will prove most effective and valuable."

ON THE IMMEDIATE AND POSSIBLE EFFECTS OF CERTAIN RECENTLY PROPOSED ADDITIONS TO THE NEGATIVE BATH.

BY W. HOWARD.*

In the concluding paragraphs of the preceding contribution it will be noticed that while Mr. Munger's assertion regarding the chemical clearness of negatives obtained from his so-called "hypo nitrate" bath is admitted to be absolutely true, no explanation of its cause is given. At the time of writing the matter was to my mind so self-evident that an explanation seemed an unnecessary and impertinent demand upon the reader's patience. Practical photographers having frequently but little time to spare for minute enquiry, I have, for the purpose of being perfectly explicit, before quitting the subject, noted down my impression of that cause by way of addenda.

* Continued from page 376.

The fact that sulphuric acid exists in a free state in the bath is sufficient to account for the clearness of the development. It, as is well known, acts as a very powerful restraining agent, and it is to this property of the acid that the clearness of the chemical effect is really due. Precisely the same effect can be obtained by the addition of sulphuric acid to the developer, and without even the most remote possibility of introducing sulphate of silver into the bath. Again, the "hypo-nitrate" bath is objectionable, because, containing such a powerful restrainer, it materially lengthens the exposure required.

Mr. Eliot's* proposed and practically tested method of working with a bath in an alkaline state is, though not so recently brought under notice, quite as startling and in opposition to generally accepted theories as the treatment with soda hyposulphite.

The mode of proceeding recommended by Mr. Eliot, who has had something like two years' experience to which he can appeal in supporting his assertions, is very simple. Instead of adding silver iodide to the nitrate bath, he saturates it with silver carbonate. This treatment, as a matter of course, renders the bath distinctly *alkaline*.

The advantages which Mr. Eliot claims for his method are very considerable—briefly, freedom from fog, pinholes, and stains. I have at various times used a bath prepared in the manner pointed out, and can say from personal experience that it possesses all the good qualities claimed by its originator. Whether chance or design led to its adoption by that gentleman I know not, but certainly it is the most useful of late improvements in working.

The first surprise in connection with this bath is that, though alkaline, it does not give foggy pictures. Mr. Eliot attributes to the neutralizing effect of the collodion he uses this immunity from the trouble named.

Beyond question, that does act as a useful safeguard, but it is to the nature of the alkaline body present that, for my own part, I attribute the unexpected freedom from fog, because even if a new collodion be used with this bath, clean negatives are obtained.

It may be laid down as an axiom that oxide of silver is the alkaline body present in baths giving foggy negatives. This body, being present in nearly all newly prepared baths, endows them with this objectionable property, and necessitates the usual addition of acid to remedy the defect.

How does oxide of silver make its appearance in a new bath? This is a question worth attention, and answering. If fused nitrate be employed for making up the negative solution, it may be taken for granted that unless that salt has been prepared in a very cautious manner, some portion has been reduced to the state of oxide in the process of fusion. This is especially true when the nitrate has been prepared from silver containing an admixture of copper. To eliminate this, fusion at a considerably elevated temperature is resorted to, and oxide and nitrite of silver are formed by the partial decomposition of the nitrate.

When a bath is prepared from crystal nitrate with common water it is always necessary to sun it, for the purpose of clearing the solution. By this sunning process the water is deprived of the organic matter which it contains; some of the nitrate, being by its agency reduced to the state of oxide, falls down as the well-known black sediment. Some of this, of course, enters into solution; the result is a nitrate bath, rendered alkaline by silver oxide.

Again, in an old bath which has turned alkaline with working, a similar process has been in operation. The alcohol and ether imparted to the solution by the immersion of the plates have reduced some portion of the nitrate to the condition of oxide, and the result is a tendency to fogging. This defect is most likely to occur when working with a collodion containing a large proportion of ammonium salts, as the nitrate of ammonium produced by their decomposition

has the power of causing a much larger proportion of silver oxide to dissolve in the bath solution. Nitrate of ammonia has precisely the same effect in relation to silver carbonate, and it may be advisable not to use ammonium sensitizers for a collodion intended to be employed in working an alkaline carbonate bath, though if the bath were occasionally distinctly acidified with nitric acid to destroy any oxide which might have formed in it, afterwards neutralizing the acid with more carbonate, I would not apprehend any danger from the increased solubility of the latter silver salt.

The lability of oxide of silver, when present in the bath, to give foggy pictures, is traceable to its aptitude for reduction. As soon as the developer is poured on, the picture flashes out almost instantaneously, but also the oxide reduces with alarming rapidity, and, unlike the less reducible free nitrate, attaches its product to the whole surface of the plate. Carbonate of silver is not so easily affected by reducing agents, and it is to this comparative neutrality to reducers that I most attribute the circumstance of the non-production of fog on plates sensitized in an alkaline carbonate bath.

Another and important advantage connected with the use of such a bath is that it permits of much shorter exposures than an acid bath. Acid in the bath, though unavoidable under the general system of working, is not desirable, because it retards very materially the actinic action in the camera. Now by this process it is very easy to get rid of free acid existing in any bath, and since no care is required in respect of not passing the neutral point—indeed, the reverse—the idea must commend itself to the practical man.

I was for a long time doubtful about a carbonate bath evading the pinhole nuisance, but I am thoroughly convinced that it does so, and further, I believe I have discovered the reason of that power possessed by it.

My old system of working was to prepare a bath with fused nitrate prepared by myself, dissolving in common water and sunning, or else in water which had been previously treated with a small quantity of nitrate, sunned, and filtered. The latter is a very old but thoroughly reliable and useful "dodge." It yields a water (or rather a very weak solution of silver nitrate) perfectly free from chlorides and organic matter. This is more than can be said of commercial distilled water, which generally contains both, and always the latter impurity, and any solution of nitrate made in it will be reduced by exposure to light; it is also comparatively expensive. By always keeping some silvered, sunned, and filtered water in stock, it is easy to produce a working bath at a short notice, or in case of accident.

When I had obtained the clear solution of bath in the manner stated, I always found it to be somewhat alkaline and foggy inclined, through containing some silver oxide. This I got rid of by the cautious addition of very dilute nitric acid till exact neutrality was reached. Then the bath was, when iodized, ready for use; but while abhorring heartily the amount of acid which would sometimes accumulate when using red collodions for copying, and likewise disliking the troublesome plan I then had of rendering the bath alkaline with silver oxide, and subsequent neutralization with dilute nitric acid, I gave Mr. Eliot's plan a trial, and am not inclined to give it up now. I still pursue the plan of adding nitric acid after dissolving the nitrate, but don't mind adding excess, because when the carbonate is added it first neutralizes that acid, producing some nitrate; the excess renders the bath alkaline. Those who think of adopting Mr. Eliot's plan would do well to acidify with nitric acid before adding the carbonate, or else this may lay upon the process the odium of having produced fog, when in fact that defect was due to oxide existing in the bath prior to the introduction of the carbonates.

Having worked the process for some time, I was puzzled by the non-appearance of pinholes. According to Mr. Eliot it is not necessary to iodize an alkaline carbonate bath: the natural inference made from such a statement is, that such a bath cannot dissolve iodide of silver. If such were indeed the case, it would be easy to understand why

* By an oversight I substituted the name of Mr. York in my last.

the expected nuisance did not occur. Carbonate of silver does not form a compound with nitrate; or, if it does, it is very readily decomposed, and cannot be made, by any device with which I am acquainted, to crystallize either in the bath or upon the plate. An ordinary thirty-five or forty-grain solution of nitrate dissolves so little of the carbonate, that it is scarcely troubled by even very copious additions of water, provided that the water used be free from chlorides. Knowing that to be a fact, and having confirmed my knowledge by actual experiment, I anticipated that such a solution must be capable of dissolving some quantity of iodide out of the plates immersed in it. In consonance with this view of the matter, when I had used my first alkaline carbonate bath for some time, I took out a portion, and diluted it with pure water. As I had expected, I was rewarded by the appearance of a bright yellow precipitate, but not so copious as in the case of an ordinary non-carbonated bath. This precipitate, upon the application of suitable decomposing agents, gave to starch the characteristic iodine-blue, unmistakably proving its character.

Still, although the bath was kept at work (not being allowed to become acid), and must have been accumulating iodide, the pinholes held aloof. Of course, I was in a state of wonderment about the strangeness of this phenomena. The only reasonable supposition that occurred to me as explanatory of this unusual reversal of effect while the cause remained, lay in the probability that the iodo-nitrate could not crystallize while the carbonate was present. My first experiment was the addition of an excess of nitric acid to my bath, upon which I obtained negatives full of pinholes—proof number one in support of my theory. The next step was to make a strong solution of silver nitrate, saturating it with silver carbonate, and afterwards with silver iodide; then I filtered and boiled it down till but a third of the original volume remained; the remaining solution was allowed to stand for several days, but no formation of iodo-nitrate crystals followed—proof number two, and, I fancy, a conclusive one, both in support of my theory, and Mr. Eliot's assertion that his bath has no tendency to produce pinholes. I have made several verifications of this experiment—both with bath and special solutions, but never obtained any iodo-nitrate crystals.

In conclusion, I would say that, while the plan of adding soda carbonate is quite effectual in imparting carbonate of silver to the bath, it would be better to prepare a stock of that compound, and add it directly to the bath, thus avoiding the introduction of soda nitrate, which, though not injurious, is unnecessary.

The only real modification of Mr. Eliot's plan that seems desirable is, that in addition to saturating with carbonate the bath should also be iodized, thus preventing the robbery of iodide from the first few plates. My own method is to dissolve the nitrate in a small bulk of water, add excess of silver carbonate, and a few grains of iodide of silver. The strong solution immediately dissolves all that it requires of the two compounds; I then fill up with the requisite quantity of prepared water, which precipitates the excess of carbonate and iodide, and after filtering I am in possession of a bath ready for work.

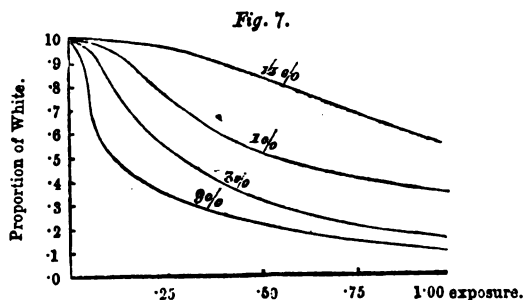
(To be continued.)

ON THE DEPTH OF PRINTS AND INTENSITY OF NEGATIVES.

BY CAPTAIN ABNEY, R.E., F.R.S.*

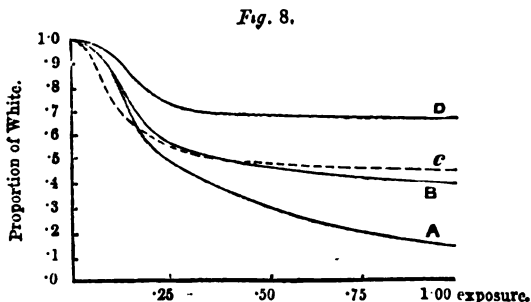
IN the NEWS of the week before last a diagram demonstrating the effect of the exposure of uniformly sensitive paper to the action of the same kind of light was shown. Before proceeding further it may be interesting to note the sensitiveness of different silver chloride papers when ex-

posed simultaneously beneath the wheel which gives increasing exposures. The following diagram shows this.



Paper cut from the same sheet was immersed in sodium chloride of $\frac{1}{3}$, 1, 3, and 9 per cent. strength, and floated on a sixty-grain to the ounce solution of silver nitrate. It will be seen that the salting solution is in a geometrical ratio of 3, and that the sensitiveness increases nearly in a geometrical ratio of 2. For instance, if with the paper salted with the 9 per cent. solution the sensitiveness is 1, with the 3 per cent. it is $\frac{1}{3}$; with the 1 per cent. $\frac{1}{9}$, and with the $\frac{1}{3}$ per cent. $\frac{1}{27}$ approximately. This is not meant to be laid down as a "law" on the subject, but it simply works out thus from these experiments. It will be noticed that the solution used for sensitizing is a strong one, and, within limits, it appears that there is no increase or diminution of sensitiveness caused by the strength of the silver nitrate solution. Where there is a large deficiency of silver nitrate, however, there is a marked alteration in the curves.

The annexed figure shows the alterations that occur, the exposures being graduated as before. Curve A is a standard curve; curve B is due to floating a 9 per cent. salted piece of paper on a fifteen-grain solution of silver nitrate; curve C shows the loss of sensitive-

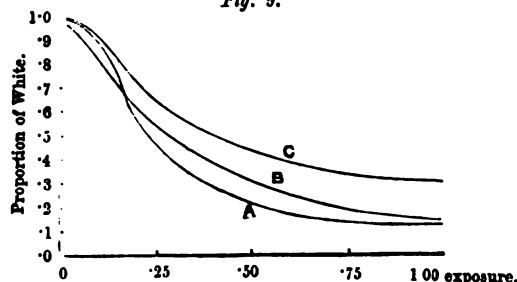


ness due to paper salted with a 3 per cent. solution of chloride floated on a sixty-grain bath, and afterwards thoroughly washed; whilst curve C shows the effect of albumenized paper sensitized and also thoroughly washed. But few remarks need be made on this diagram, as it speaks for itself. The chief lesson to be learnt is, that for each strength of chloride (and albuminate) there is a limit, below which it is not safe to reduce the strength of the silver nitrate solution. I should rather be inclined to fix the latter at two-thirds the strength of the former, though I write with some hesitancy on this point. Unless fuming the paper be adopted, or some chlorine absorbent be substituted for the silver solution, washed paper is evidently likely to want in depth.

In the next diagram the curves are also due to different exposures. A is that of ordinary sensitive albumenized paper; B, of albumenized paper in which there is no chloride or other salt; and C of a three per cent. salted paper. All were sensitized on a sixty-grain bath, and exposed simultaneously in the exposing-apparatus to a very subdued light. It will be noticed that the blackening of the last is greatest, and of the second the least, whilst the ordinary sensitized albumenized paper

occupies an intermediate position. Evidently, then, besides filling the merely mechanical part of holding the silver chloride in situ, it fulfils an important part in the

Fig. 9.



depth of the print. Comparing the ordinary albumenized paper with the salted paper curve, where the exposure has been shortest, the colouration is least in the former, and falls more rapidly down towards blackness than does the latter. Probably most photographers who have had experience in plain paper prints have found the difficulty of obtaining the same gradation in the highest lights that they have obtained with facility with albumenized paper, and the "reason why" may have not occurred to them. The above diagram illustrates this difference in gradation—if it may be so called—and it may not be uninteresting to seek the reason of it.

The albuminate of silver when exposed to light takes a reddish tint, absorbing the blue. Now, where there is absorption of light there must be work performed in the absorbing body, and in this case the work performed is the chemical decomposition of the organic salt of silver. It is evident, then, that in the top layer of the albumen the darkening will take place very rapidly at first—so rapidly, indeed, that that layer will quickly attain its maximum darkening and red colour. This will cut off the actinic rays from the succeeding layer, and the blackening will proceed more slowly. Silver chloride, on the other hand, darkens to a violet colour, and even the darkened layers allow the actinic rays to penetrate, consequently the depth of colour is attained more regularly than with the albuminate. We now see why the character of prints obtained from the same negative is changed when the amount of chloride in the albumen is varied.

We now pass on to a very much more important point in regard to prints. There is no doubt, as experiment has shown it to be correct—and experiment agrees with theory in this case—that different *qualities* of light affect the curves obtained in a different way. The light from the sun, the light from the sky, and that coming through clouds on a dull day, all differ materially in quality, and when I say quality, I mean as regards the spectrum obtainable from them. If equal intensities of sunlight and blue sky light be taken, for instance, it will be found that sunlight is deficient in certain of the blue and violet rays, which are, comparatively speaking, in excess in the sky-light. This is as might be expected, since the light of the sky is merely sunlight reflected from small particles of suspended matter. The sunlight, after passing through this cloud of infinitely small particles, must be robbed of a portion of those rays which give the sky its blue appearance, and the light from the latter must be richer in these very rays than the former. So again the light from the sky or the sun, after passing through a cloud, must be deficient in certain portions of its components which are absorbed by the watery vapour.

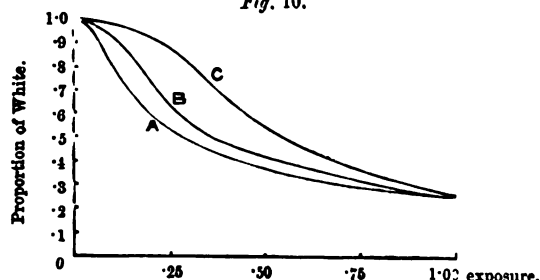
For example's sake, we may imagine that our original sunlight contains one particular blue ray, and one particular violet ray, and that the sky robs it of the violet ray, and allows the blue ray alone to be transmitted, the sky in this case will only reflect the violet ray.

Let both the filtered sunlight and the sky-light now

act upon silver chloride. If the darkened chloride absorb the violet ray much more rapidly than it does the blue ray, it is manifest that the curve of intensity for equal exposures must differ in depth of blackening, and also that if the darkening due to the violet and to the blue, at the extremity of the scale (as given in the diagrams) be equalized, it is also evident that the curves will not be symmetrical. Of course the hypothesis that has been made cannot strictly hold good; every part of the spectrum is present both in sunlight and also in skylight, though there are deficiencies in intensity in portions of each. Hence it is that different curves result from exposure to different qualities of light.

The following diagram gives curves of intensity for light radiating direct from the sun, from sky-light, and from light diffused through a cloud on a cloudy day.

Fig. 10.



The paper employed was ordinary albumenized paper sensitized on a sixty-grain bath. (Curves showing similar differences might have been given for ordinary salted papers.) A (was paper exposed in sunlight; B was paper exposed to a clear sky; and C was exposed in very dull light.

Comparing curves A and C together, we obtain information regarding the printing of pictures on a point which has often been a puzzle to the thinking photographer. 9 in the scale of whiteness is for all intents and purposes practically white—at least, it would be considered so unless absolutely pure white were placed in juxtaposition with it. Running a line parallel to the base to cut the curves, we find that in A it answers to the exposure 0.075, and in curve C to exposure 0.2 of the total. Now, since in a negative the amount of exposure given to paper depends approximately inversely as the opacity of the negative, it is evident that to start with the same purity of white, and to attain the same blackness in the deep shadows, a negative need be less dense in the highest lights if printed in the shade than if printed in the sun; in other words, that the relative opacity of the highest lights in the two cases should be about as 8 to 9.025. Here we have a gain of no small advantage, particularly when it is seen that the negative printed in the shade has the curve which most nearly coincides with a straight line.

To every tale there should be a moral. In the case before us it is this.—You may modify your prints almost indefinitely by altering the light in which you expose the negatives, be it by printing on a dull day, or by superimposing various coloured media. This subject alone is a large one, and should be followed up by photographers by practical experiments.

PHOTOGRAPHY IN AMERICA.

BY NORMAN MAY.

I READ with great interest the experience of your correspondent, Mr. J. C. Stephens, in New Zealand, and doubtless the information he imparts will be useful to many, and prevent some from wasting their time and money in a fruitless search after a photographic El Dorado.

Had I such information regarding the prospects in

America, I should have thought twice before leaving comfortable old England. However, I am not going to write of my own adventures or misadventures, but rather to give my impressions, and what I saw of others' success during a three years' residence in the States and Canada.

The mistake English photographers make, is to greatly underrate the Americans' abilities and numbers; and the assistant often goes to the States expecting to find large tracts of country and dense populations almost destitute of photographers; and should he fail to get a suitable situation, he can, he thinks, easily hang out his specimen frame and do a large business at once. But a month or two in the country will open his eyes. He finds in the large towns that every few doors there is a photographer, and nearly every village of 500 inhabitants has its self-styled "artist."

The American youth, even more than the English one, has an objection to what he considers hard work—i.e., manual labour—and thinks his dyspepsia is greatly owing to his working between meals; so he goes in for a nice light business, in which he can, for a comparatively small expenditure of muscle, get a kind of employment "where the work is put out." He goes to a photographer, pays his premium of fifty dollars or so, and is taught the "whole art of photography" in a month or two, and comes out as a full-fledged operator, colorist, and retoucher.

As an instance of this, I once saw an advertisement in an English journal from an "American assistant, aged 17, who thoroughly understood every branch of the business; salary, £3 3s." Perhaps seventeen was a misprint for twenty-seven or thirty-seven, but whether it was or not, I've seen many similar instances in the States. Five or seven years' apprenticeship would horrify an American. When his short period of tuition is up, he looks about him for a situation in which he can improve himself, preparatory to starting on his own account, and failing to obtain one, in the majority of cases he has a "go in" at once for a little business. It almost seems as though every one who finds blacksmithing or farming too hard work, has a try at photography.

A Canadian photographer of my acquaintance, whose name is not altogether unknown in American photographic journals, had three farmers' sons at one time as pupils. They paid their dollars, learned to take a ferrotype and got a general insight into the business, and a few months afterwards their respective signboards and specimen frames made it known to the inhabitants of some obscure village that a new "artist" was added to the already superabundant stock. Some pupils who start in this way are steady, pushing sort of fellows, and they make their little knowledge go a long way, and though their productions are very inferior at first, they please their customers, and as the average American is more shrewd, as a rule reads more than English photographers, and is altogether, to use their own expression, a more "live man," he gets on by energy; and not being above a hint from more experienced men, in time he is a good hand, and moves to a larger town.

As all cannot succeed, the weaker go to the wall, and I have seen dozens of men who at one time in their lives had their few months and a start at photography only to give it up in disgust, and turn to something for which they were better adapted. So the market is always full to overflowing, and the photographer has many applicants for situations, and, as a consequence, wages are much lower in proportion than in England, while the extremes of heat and cold render the climate at first very trying to English constitutions. I've seen the thermometer 110° (Fahrenheit) in the shade day after day, and in the winter 30° or more below zero, though the air is much drier and more exhilarating than in England; and I know of nothing more enjoyable than a good sleigh ride with a temperature of about zero, or a skate on ice of two feet thickness.

(To be continued.)

OPERATORS AND EMPLOYERS.

A LADY writes to the *St. Louis Practical Photographer* as follows:—

"DEAR SIR,—Will you allow space in your journal for a few suggestions by a lady? My husband was an operator. Thank God, he is no longer. His latest employer was an ancient dame, who thought what she could not see through her gold-rimmed spectacles was of no use or interest; and my husband, while in her employ, had to sink his manhood to keep his situation. Now, Mr. Editor, I wish to make a plea for operators. Why is it that an operator is usually treated as if he were a mere puppet? Is it not the operator whose skill and ability make the reputation of the gallery? If the proprietor is an artist, why is an operator necessary? If an operator is necessary, is there any reason why he should be sunk into nothingness by the proprietor? In my husband's case, while the proprietor could not make a negative or retouch one, she claimed to pose every lady and most gentlemen—to twist them into all sorts of shapes; and if by chance a lady came in and had a sitting without her assistance, her usual comment was, 'I am so sorry I was out; I would have had her sit again.' Now, I humbly suggest to all employers, male and female alike, either do your own operating, or leave it to your operator. If he is not qualified, discharge him and get one who is. If he is, then trust your business to him. If you cannot trust him, how do you expect your patrons to do so? What spirit has an operator to work when at every move he is met by some whim that he must humour, or give up his situation? I have often seen my husband stand waiting with his plate by the camera until it was spoiled, while 'ye ancient lady' was fixing this ribbon or that lock of hair, while a room full of customers were losing patience, time and money alike being wasted, and the confidence of the sitter in the operator utterly destroyed, for the sitter thought so much fixing must necessarily result in a good picture—but lo! the plate was dry and worthless, and the whole thing was to go through with over again. I have seen my husband make from twenty to thirty sittings without missing one; but at the gallery I speak of, the first sitting was usually a failure, until he changed his style and left the plate in the bath until her efforts had culminated in fixing the sitter as straight as a statue and twice as stiff. My advice is, engage a good artist, pay him a fair salary, then lock to him to do good work. If he fail, there are plenty who will not fail; but if you insist on doing the posing yourself, then take the blame when you fail, as well as the credit when the operator succeeds."

The following note is appended by Mr. Fitzgibbon, the Editor:—

"We beg leave to differ with some of the strictures of our fair correspondent. In her plea for operators, she looks, we are afraid, through a more powerful magnifying glass than the ancient dame she speaks of. We emphatically say such ancient appendages have no business in and around a photographic gallery that is progressive. The plea for 'my husband' may be all right and natural; but then there are other operatives besides the husband who who wait watching, supervising, and constantly looking after, if not by ancient dames, by somebody else, to see that they attend to their business right. It is not necessary, because a proprietor understands his business in all its parts, and is proficient, that he should not employ help or assistance, but be compelled to do the work of half a dozen hands, as our correspondent would have him. Again, ancient dames with four eyes are seldom met with in galleries. Some of the principal operators in fine galleries have it all their own way (too much so at times for the proprietors' interest), and many of them know more than the proprietor, and are allowed full sway and management of the same, and are treated in a gentlemanly and sensible manner by their employers when deserving. We believe it to be the mutual interest of both parties to work in harmony together. If

arrogance or ignorance predominate with one or the other, do as I. X. Peck says, discharge yourself or employee, and find another more suitable to your tastes, where there are no ancient dames to domineer over the genius of husbands or any other man."

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual outdoor meeting of this Society will take place to-morrow, Saturday, August 4th, at Hampton Court. The members and friends will meet together at the Mitre Hotel, at six o'clock, to partake of tea.—On Saturday, July 21st, the annual invitation of the President to the members to meet at his house took place, when many availed themselves of the very liberal hospitality which the Rev. F. F. Stitham so genially offers on these occasions, and a most enjoyable evening was spent.

INDECENT PHOTOGRAPHS.—Martha Abrams, 55, and Peretz Abrams, her son, 15 years of age, were charged before Mr. Barstow, at Worship Street, with selling indecent prints and having indecent prints in their possession.—It appeared from the evidence of Detective-sergeant Tew and Detective Vincent, H Division, that the prisoners were in the City Road with a stall, on which were spread a number of photographs, cartes-de-visite, &c., for sale. Some information had been previously given to the officers that the prisoners offered privately the photographs to men. The officers made one or two purchases, and then asked the boy if he had anything else to show them, and he, going to a corner of the stall, beckoned them to him, and then produced a quantity of obscene prints, and sold them to the officers at 2d. each. The boy and woman were then taken into custody.—The magistrate examined the photographs, of which a great number were produced by the officers. There were certain productions of a French character, principally caricatures, but the majority of the photographs were copies of well-known works of art—"Leda and the Swan," "Perseus and Andromeda," "The Greek Slave," &c.—Mr. Barstow was of opinion that the works were indecent within the meaning of the Act, and ordered them to be destroyed. He fined the woman 40s., or one month, and discharged the boy, believing that he had acted under his parent's direction.—*Daily News.*

IMPROVING HEAD-RESTS.—A correspondent of *Anthony's Bulletin* writes:—"Your May number contains a very useful suggestion—from Mr. N. K. Cherrill, of English fame—regarding the construction of common head-rests with two bearing points for securing the upright rods. The suggestion would remedy a serious defect, and should be heeded by manufacturers in future; but it does not help the thousands of head-rests now in use, and constantly giving more or less annoyance, as Mr. Cherrill describes. I am using a simple device involving the same principle, that can be applied to any, and which removes most of the difficulty. I take about twelve inches of copper wire of suitable size, and, bending the centre around the neck of the standard, twist it firmly, and thrust the two ends over and down the empty hollow; thus when the rod is replaced we get the two points of contact, and the consequent firmness, at very slight cost." "E. K. Hought."

SILVERED PAPER is dangerous to leave lying about loosely. It easily takes fire, and can't be smothered out. We know of a gallery last month that came near being no more by the silver paper taking fire while being dried. Scraps and cuttings come under the same head.—*Practical Photographer.*

To Correspondents.

D. H. T.—Rolling machines of the kind you describe generally answer very well for cards, but the result is not the same as that given by a burnisher, as the principle is essentially different. The addition of a steel plate would not make it the same as a burnisher. The burnisher has a fixed burnishing surface, and the picture is carried under it, the picture moving whilst the burnisher remains fixed. The question whether it is worth while to purchase a burnisher whilst you have a good rolling press is one for your own judgment. You know what kind of surface your press will give, and you have doubtless seen the results produced by the burnisher, and it is for you to judge whether it will answer your purpose to go to the extra expense. Weston's burnisher is a very good one.

E. M.—Negatives for transfer from glass should not be varnished, as the varnish often permeates the film, and cements it to the glass, and makes it difficult to remove. In some cases, however, when gelatine is used for transferring, the coating of gelatine, contracting in drying, brings away the negative film with it on curling up and leaving the glass. When leather collodion is used for transferring, when the coating is dry, if the plate is placed in water, the two films will then often leave the glass together.

G. M. D.—New glass, as a rule, only requires washing in water; but if any doubt be entertained that it is greasy, use a cream of rotten stone and alcohol to rub it with. Polish this off with a piece of clean, soft linen cloth, and polish finally with a clean leather. Old glasses—by which we mean those which have been used—should be rubbed with nitric acid; or the following mixture is a good detergent:—

Water	...	...	...	...	6 ounces
Sulphuric acid	...	...	...	...	1 ounce
Bichromate of potash	...	...	...	...	1 "

This should be followed by thorough rinsing.

PORTRAIT AMATEUR.—There are various modes of reproducing negatives. The simplest method is to produce a transparency in the camera, and from that a negative by the wet process, also in the camera. As a rule, however, negatives are better when reproduced by contact printing. The "dust" process, as it is called, produces very capital results. That has been described both in these pages and in our *YEAR-BOOKS*. Contact printing on dry plates, or on collodio-chloride, also answers well.

J. W.—Your efforts have certainly not been successful, and are rather discouraging; but you must persevere hopefully. In the first place, your negative is not good; it is not sufficiently intense, and lacks sufficient contrast. It has been slightly over-exposed. Try a weaker developer, use eight grains of the iron salt, and fifteen minims of acetic acid to the ounce of water. Then you are under some mistake as to your printing. The paper you mention needs no exciting with silver, as it is already sensitive. There appears to be your greatest blunder. You should try at present the simplest formulae. Try the acetate bath for toning. Your negative is not quite sharp. If you use it with the stop the exposure must be considerably increased.

YOUNG PRINTER.—There are various proposed modes of making a silver bath which shall not readily discolour, and the paper excited upon which shall keep a few days without discolouration. In our own practice we find a forty-grain bath made with commercial nitrate of silver, every pint of which contains about three ounces of methylated spirit instead of water, answer well. If the paper be floated not too long, and be drawn over the edge of the dish so as to remove as much excess of silver as possible, it will not discolour inconveniently rapidly. In hot weather, of course, it will discolour much more readily than in cold. If it be required to keep a few days or weeks, the use of washing, or the addition of citric acid, or some other of the appliances recently discussed in our pages, will be found useful. You will find an article describing the various modes of restoring a discoloured bath in our pages a few weeks ago. There is no short cut, no royal road, to photographic knowledge and success. You must read and study what is written on the subject, and acquire experience by personally trying the various methods recommended for given ends.

DESPERANDUM.—The film leaving the plate in the bath may be due to several causes. The use of a horny, tough collodion, somewhat too thick, will cause it; but the most common cause is the use of a very acid bath.

YOUNG PORTRAITIST.—The chief cause of your failure to produce satisfactory vignettes is the use of too dark a background. To succeed well in vignetting, the background screen should be of a light grey tint; it is then easy to secure soft gradation in vignetting the background tint into the white of the margin.

R. F.—The reticulation in your collodion film is probably due to the presence of water, the solvents used having been insufficiently rectified. Some samples of pyroxyline favour this tendency; but the fault is generally in the ether and alcohol. We fear there is no remedy. The collodion may, however, be useful for addition in small quantities to a collodion giving a horny, repellent film, as such a collodion would be improved by the addition.

B. B. S.—We have often endeavoured to impress upon readers the fact that it is impossible to secure a brilliant print with a rich tone of either purple, brown, or black, without a good negative with sufficient intensity and contrast. A thin negative permits only of a thin deposit of silver in printing before the lights are over done, and a good deposit of silver in the blacks is necessary to a rich tone. With a weak, poor negative only grey or light brown tones can be obtained.

B. G.—A gas stove may be used in the dark room if it have a proper flue to convey the products of combustion to the open air. But in any other circumstance it is unwise, as such products are very undesirable in the room.

A LADY AMATEUR will find the screen described on page 100 of our last *YEAR-BOOK*, by our esteemed correspondent, Mr. Norman May.

Several Correspondents in our next.

The Photographic News, August 10, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE BRITISH ASSOCIATION AT PLYMOUTH—RECORDS OF GUNPOWDER EXPLOSIONS AND SHOT AND SHELL PRACTICE—THE SPECIAL CORRESPONDENT.

The British Association at Plymouth.—The British Association holds its annual gathering next week at Plymouth. The names of the presiding officers of sections have already been announced some time, and the President of the Association for the present year, Professor Thomson, will deliver his inaugural address on Wednesday evening. The British Association has for some time past been characterized rather as an annual holiday for scientific men than for anything else, and the locality chosen on the present occasion is sure to be popular for this reason, if for no other. The proximity of Plymouth to the playgrounds of the West country is sure to lure many to make holiday in that direction, for North and South Devon, as likewise the whole of Cornwall, are not very far off. Penzance and the Land's End districts are very charming spots for a short tour, the Lizard, Kynance Cove, Marazion, St. Michael's Mount, the Loggan Stone, quaint little Mousehole, and other spots being all worthy of a visit. Photographers will find it well worth their while to take a camera and a few dry plates with them, should they feel tempted to join the meeting of the British Association, and afterwards take a ramble through the country, either on their own responsibility, or under the wing of the officers of the Association. These, as usual, have already made arrangements for the excursion of members to various districts around Plymouth, and to those who are not acquainted with the fact we may mention that those who join these excursions do so at a very moderate cost to themselves. Indeed, it is a very good guinea's worth that one realizes on taking a member's ticket, if a man have a penchant for scientific gatherings and soirées, for beyond the privilege of entrée to all these gatherings, members, as we have said, have the right to join the excursions which have been organized; only, it is necessary, when choice has once been made of the excursion to be undertaken, that the member should secure tickets for the same at the earliest possible moment, since, as might be expected, the favourite tours are much run after, and the issue of tickets is frequently limited. A feature of this year's meeting at Plymouth will be no doubt a visit to the interesting Government works of the seaport. Plymouth has lately given way to Portsmouth as a dockyard, and all our big ironclads, such as the *Inflexible*, *Dreadnought*, *Thunderer*, &c., have been fitted for sea at the latter station, but still there is much to see at Plymouth and Keyham, on the Hoe and at the magnificent Breakwater, which cannot fail to be interesting to visitors to the British Association gathering. The Eddystone Lighthouse will, as a matter of course, be visited, and no doubt any of Her Majesty's ships which may happen to be lying off the port will form the object of another excursion. Therefore, although the British Association may not present such scientific interest as was formerly the case before societies were formed in London and other centres for the discussion of each and every branch of study, there is still sufficient attraction, in one shape or another, no doubt, to make the gathering this year a successful one.

Records of Gunpowder Explosion and Shot and Shell Practice.—It is now some years since the Home Office determined to appoint officers to look after the manufacture of explosives throughout the kingdom, and to make strict enquiries into the circumstances of accidental explosions, with a view to reducing the number of these calamities in the future. The officers chosen were men of some scientific attainments, and it at once occurred to them that valuable teaching might be secured by photographing the scenes of disasters, and in this way secure a truthful record of the effects produced. This step

was sanctioned by the Home Office some time ago, as we took occasion to make public in these columns, and from that time to this the inspectors have made it a feature of their investigation to secure photographic records of the scene. The results of these measures are now becoming apparent, for by a prolonged study of the effects of various explosions, the officers have become very experienced in the matter of finding out the cause, and discovering the nature of the explosive which has caused the mischief. Thus the difference between an explosion of gunpowder and one of dynamite can at once be appreciated by officers whose duty it is to investigate these occurrences, and their information has been in a great measure secured by a study of the collection of photographs obtained from time to time in the course of their duty. A brick wall, for instance, which has been shattered and thrown into a heap of ruins, would at once tell the Home Office authorities that a slow-burning explosive, whether gunpowder or fire-work composition, had been at work; while if the explosion would seem to have cut down a structure as sharply as with a knife, then this is a pretty good proof that some of the terrible detonating compounds have caused the catastrophe, and *prima facie* evidence is at hand that gun-cotton, dynamite, lithofracteur, fulminate, or some such materials have wrought the damage. No draughtsman could record the results so truthfully as the camera does, and as it is here not a question of two or three points, but of the general aspect of the scene, photography is especially suitable. A similar application of the art is made at the School of Gunnery at Shoeburyness, as many of our readers know, where the effects of shot and shell against iron plates and stone casemates are recorded in a similar manner. The committee which is entrusted with the duty of experimenting with guns *versus* armour employ the camera to illustrate the reports made from time to time, and these can hardly be exaggerated, one way or the other, so long as the statements are supported by pictures taken on the spot. Where a shot definitely pierces a target, the daylight let through is at once evident, while we see also the nature of the hole, whether torn or jagged, or smoothly punched out. Not only is a front view taken of the target, but a photograph of the back also shown; and if the shot or shell has penetrated, the damage done to the supports and rafters (which represent the 'tween decks of a ship) is at once evident. Or if the shot has lodged in the target, although from the front no injury is apparent, it is frequently the case that a photograph secured from the rear will show an ominous bulging of the plate, and a starting of the backing. As there are always two parties deeply interested in the matter, namely the gunmakers and the ironmasters who have furnished the plates, it is exceedingly necessary that there should be an impartial judge, and this is furnished by the camera. Only last session there was some ill-feeling raised in the House of Commons on the question of the penetrative power of the so-called "Woolwich Infant," or thirty-five ton gun; and while the Surveyor-General of the Ordnance affirmed, on the one side, that a certain shot had penetrated the target, another member of Parliament, Captain Price, vowed that the projectile had not done so. In this case the dispute was soon settled by a reference to the report of the officer who had charge of the experiments, and a picture of the results, secured by the camera at the time of the trial, forthwith furnished evidence which none could gainsay. In these two instances, then—namely, the record of explosions and of shot marks—photography fulfils a purpose the value of which must readily be appreciated by everyone.

The Special Correspondent.—From Tiflis comes to us news which shows that the regulations in respect to newspaper correspondents with the Russian Armies are being made more strict than was at first contemplated. We remarked some time ago in these columns that the correspondents were to wear an official badge, and to carry a permit bearing upon it a photographic portrait of the correspondent to allow of the person of the latter being identified. Now it appears that

the journalist has to be provided with an endless number of such portraits, to be distributed to all the chief officers or commanders of corps, so that these may have the wherewithal to identify strolling adventurers, of whom, we are told, large numbers are to be found in the camp. Under these circumstances, gentlemen proceeding to the East to act in the capacity of Special Correspondents will do well to provide themselves with a few dozen cartes-de-visite.

SHARPNESS AND HAZINESS IN PORTRAITS.

BY DR. LIESEGANG.*

THE photographer usually looks at his work from quite a different point of view than the public. For what reason does he give over his negative to the retoucher? As in early days the positive-retoucher, so at present the negative-retoucher, is a skilled hand. Not to spot prints is he engaged, but to soften the sharpness of a negative. It is true, photography increases the contrasts, whenever there is opportunity for so doing. High lights are always heightened at the expense of those hardly so well illuminated; the developer also attracts silver from the sides where a white band, a bright cloud, a light-coloured background, are to be found, and the darker parts suffer in consequence. Moreover, in printing, at any rate upon albumenized paper, the higher lights lose something in the toning and fixing baths, while the shadows allow a portion of their details to sink into the paper.

In order, therefore, to present the sharp negative to the public in a favourable light, it is given to the retoucher, who swells the cheeks and softens the hard lines upon it; in a word, everything is equalized when possible, and finally—the portrait is made as unlike as possible.

Why does the photographer make his negative sharp, if he has to have it softened down afterwards? Would it not be more simple to make a soft delicate negative in the first place, and then dispense altogether with the retoucher?

English photographers say, yes. The public asks our English brethren for "soft pictures," and these are supplied. The difference between "sharp" and "harmonious" pictures was once explained to me thus: "Sharp, is the parrot's cry; delicate and harmonious, is the song of the nightingale."

The ways adopted in England to secure harmonious (the German for which is unsharp) pictures are several.

Madame Cameron, of Ceylon,† who has taken a large number of very valuable life-sized portraits of well-known personages with charming haziness, they tell me, is in the habit of telling her sitter at the critical moment to shake his head a bit. Those who have seen the pictures will not entirely disbelieve this story. At any rate, it is certain that Madame Cameron has found many disciples, and that many English photographers supply their customers with hazy pictures, or what we should term unsharp prints, although perfectly able to furnish sharp images if they desired. A striking example of this is afforded by a series of Imperial portraits lying before me now, and which are the work of a well-known London firm.

Like the Cameron pictures, they are soft, fully lighted, hazy; there is, in fact, not the least sharpness to be seen, even in the case of the smallest lines, formerly looked upon as a condition towards good photography. This much is certain in connection with these pictures: no painter can find fault with them on account of any disagreeable "microscopic" sharpness. In the series, however, to which I refer, there are a few pictures of the artist himself who has sent them; they are the only exceptions, and are sharply in focus, so that they seem to say: "I, as a photographer, like sharp pictures, but the public will have its own way, and, therefore, I produce them hazy." At first sight these unsharp pictures do not take one's fancy much, but they grow

upon you after a time, like the water-colour sketches in the English galleries.

It is very certain in any case that photography gives an excessive sharpness, and that all photographers do their best to soften it down: some by retouching upon the negative, others by peculiar methods of lighting, and others, again, having recourse to modifications in printing. In a most singular manner, however, do positive prints secured in this way differ from pictures obtained by the Daguerrotype or Ferrotype process. Especially the latter method in its improved form shows us how to secure prints of a character which leaves the results of the brush very far behind. In my opinion it is a grave error connected with the photography of to-day that a negative is secured first of all in the camera. Colour, as well as the thinness and thickness of the precipitated silver, combine in such a manner that it is often very difficult to determine the printing capacity of a negative as soon as it differs in the least degree in respect to its usual well known qualities. Would it not be much better to secure a good positive in the first place, and to produce therefrom a negative capable of being printed?

Again, were this the case, that a positive was produced in the first instance, this could be at once reproduced, enlarged to life-size, or reduced, as the case may be, and positives in collodion printed off which are very rapidly produced, can be transferred to any kind of material, and are as beautiful as they are permanent. Experiments already undertaken in this direction have, I may mention, proved the possibility of a pure positive process of this kind.

ON SOME SIMPLE LABORATORY MANIPULATIONS.

BY DR. P. TOWNSEND AUSTEN.*

THERE are many little operations performed in the laboratory which, although they are not of great importance, are still often of convenience to the working chemist. Sometimes a simplification or improvement of these little processes may save much labour and annoyance.

Use of Felt Pads in Protecting Glass Vessels.—The destruction of glass vessels is dependent on many causes. The vessel may stand on grains of sand which scratch the glass. If the glass is not well tempered it may sometimes, on being slightly scratched by these grains of sand, suddenly go to pieces, somewhat in the manner of a Prince Rupert's drop. If stone surfaces are used on the laboratory tables, accidents occur continually. Vessels, if not placed very carefully on the slabs, may be struck against them. Or if a glass vessel containing a hot liquid be placed on a cold stone surface, the glass around the bottom is quite certain to crack.

After trying various means of prevention, I found that pads of felt were by far the best mediums for protecting glass vessels.

Felt, about half an inch in thickness, such as is used in restaurants for placing under beer glasses or for roofing purposes, can be bought at a very moderate price. It should be cut up into squares, or, better, into oblong pieces ranging from two by four inches to eight by twelve inches. A beaker filled with a hot liquid—boiling sulphuric acid, for instance—may be placed with perfect safety on one of these pads. The felt is a very poor conductor of heat, and the glass hence preserves its temper admirably. Neither is there enough resistance offered to the glass surface to allow it to be scratched by any grains of sand which may perchance be on the felt. By striking the pads against the table all sand and grit may easily be removed from them.

The softness of the felt removes all chance of breakage, and it is really remarkable how long a set of beakers will last when always allowed to cool off on felt pads.

* *Photographisches Archiv.*

† The esteemed writer would say Isaac of Wight.—Ed. P.N.

* *Chemical News.* The suggestions which follow will prove of service to many of our readers.

If the pads get wet, a day in the air-bath will restore them.

I make it a rule, in my work, to have a pad under every piece of glass apparatus on my laboratory table. If felt cannot be obtained, pads of thick carpet may be used with good effect.

The Elimination of Crystals by the Microscope.—In chemical research the microscope plays an important part in revealing the presence of crystalline substances in solutions. The usual method of preparing substances for examination by the microscope when, as in the laboratory, fine microscopes, animalcules, cage, and other conveniences are not at hand, is to evaporate some of the solution on a watch glass over a micro-chemical gas-flame, and then rub with a glass rod, when the crystals begin to grow on the minute scratches in the glass, and thus set up a general crystallization. The crystals formed in this manner, however, are rarely satisfactory, being often broken, misformed, or mixed with a large amount of the substance in a partially amorphous state.

If the solution be evaporated to the right consistency in a watch-glass, and another watch-glass of the same size, previously warmed, be placed upon it, the drop expands to a film. The upper glass should not be pressed, but allowed to rest of itself. The film is similar to the one obtained in an animalcule cage, being, however, thicker. If now a few drops of ether be placed in the upper watch-glass, the cold caused by the evaporation of the ether will cause a crystallization to take place between the watch-glasses. The growth of the crystals can be quite accurately managed by increasing or diminishing the cold on the surface (by blowing on the ether).

The crystals formed are, as a rule, perfect in shape. I have by these means obtained well-defined crystals from solutions which, by rubbing with glass rods, afforded me only amorphous powders.

FREEZING MIXTURES.*

THE numerous and varied applications which ice has found in these times have greatly enhanced the importance of that product, and, while large portions of it have annually been transported from the colder to the hotter regions of the globe, scientific ingenuity has attacked, energetically and successfully, the problem of producing cold by artificial means for industrial and other purposes. In a recent number of *Dingler's Polytechnischer Journal* Professor Meidinger has an instructive paper giving an account of the progress made in recent years in the art of ice manufacture.

There are three ways indicated by physics in which temperature may be lowered, and ice formed—viz., solution of solid substances, evaporation of liquids, and expansion of gases. The following is an abstract of that portion of Professor Meidinger's paper relating to production of cold by solution:—

Heat is absorbed in bringing solids to the liquid condition; and the cold thus produced may prove sufficient to convert water into ice.

The best known of the numerous freezing-mixtures that have been hitherto described is, of course, one involving ice itself: it consists of three parts of ice, and one part of ordinary salt.

Dissolving concurrently, these two substances give a temperature of -21° C. (the freezing point of the solution). The melting of only a part of the mixture is sufficient to produce this temperature throughout the mass; and with constant admission of heat, and stirring, the low temperature is maintained till the whole is dissolved. The freezing-apparatus of confectioners is well known: a tin pot containing cream, a wooden or metallic vessel inclosing the pot, and the interval filled with ice and salts, which is frequently stirred, that the ice may not sink to the bottom. In a Paris

machine for home use the agitation of the freezing-mixture is maintained by rotation of the double cylinder containing it and the cream vessel round an axis at right angles to the cylinder's length. Professor Meidinger has constructed a machine based on the observation that a solution of ordinary salt under 0° also fuses ice, and, so long as its concentration is maintained, produces the same low temperature as the mixture of salt and ice. He provides a sieve-like vessel, containing salt, to maintain the concentration as the ice melts. The lowering of temperature is uniform throughout the vessel, and no stirring is required. The machine has come largely into use in perfumery.

On the basis of his own experiments, Professor Meidinger has formed a table showing the respective merits of various freezing mixtures. The following extract contains the most serviceable:—

Mixture.	Decrease of temperature.	Specific heat of the solution.	Volume weight of solution.	Loss of heat units.		To use for 120c		Cost in Marks.
				1 k. Mixture.	1 l. Mixture.	Salt k.	Water k.	
1 ordinary salt, 3 ice.	21° 0.83	1.18	125	100	0.5	1.5		0.34 to 0.12
3 cryst. Glauber salt, 2 concd muriatic acid	37° 0.74	1.81	55	74	2.7	1.8		1.0 to 0.6
2 nitrate of ammonia, 1 sal ammoniac, 8 water	30° 0.70	1.20	42	51	3	3		7.6 to 6.8
3 sal ammoniac, 2 saltpetre, 10 water	26° 0.76	1.15	40	46	2.1	4.2		2.6 to 2.2
3 sal ammoniac, 2 saltpetre, 4 cryst Glauber salt, 9 water	32° 0.72	1.22	50	61	2.5	2.5		1.8 to 1.6

Salt mixtures give much greater lowering of temperature than simple salts, as they dissolve in much less water. Thus, one part sal-ammoniac is dissolved in three parts water, and lowers the temperature about 19° ; saltpetre dissolves in six parts water, and lowers the temperature about 11° . (Compare the fourth and fifth on the list). It will be seen that the salt-ice mixture proves considerably more energetic and cheaper than any of the others so far as use of the materials only once is concerned. The second mixture, too, cannot be restored; nor can the last, easily, on account of the crystallized Glauber salt. Both are comparatively cheap, however. The mixture in which, by vaporisation of the solution, the salt is easily renewed in its original condition, nitrate of ammonia and sal-ammoniac, is so costly at the first that it would not do to use it only once. This was the mixture employed in an apparatus first exhibited by M. Charles at the Paris Exhibition in 1867. The tin vessel containing the substance to be frozen is inclosed in a large wooden vessel containing the freezing mixture, and is furnished with screw wings, which stir the mixture as the vessel is rotated. Another form is that of Toselli's *glacière Italienne roulante*. The cream or other such substance is enclosed in a conical-shaped vessel suspended in the freezing-mixture, and the outer vessel, enveloped in cloth, is rolled to and fro on the table. None of these machines have found very extensive use. Large masses have to be operated with to obtain even small results; and the sum of operations must generally prove too troublesome in a private house.

As to the question of manufacturing ice on a large scale

* *English Mechanic.*

by means of solution of salt, Professor Meidinger comes to the conclusion that by means of 1 kilog. of coal (for restitution of salt used) not more than 2 kilogs. of ice can be prepared; not to speak of the machine force required for transport of the large quantity of liquid. This is very unfavourable; an ammonia machine will give four or five times better results. Much improvement is, in the circumstances, hardly to be looked for. It would be necessary to find a salt that, in dissolving, gave a much greater lowering temperature than the mixtures known, and this cannot be expected, since all the known salts have been examined in reference to this point. The real cause of the small productions of such apparatus lies in the fact that restitution of the salt is effected only by change of aggregation (vaporisation), and this involves large expenditure of heat. It may be mentioned that, according to experiments by M. Rudorff, on cold produced by solution of 20 different salts, the two which gave the greatest lowering of temperature were sulphuretted cyanide of ammonium, and sulphuretted cyanide of potassium—105 parts of the former dissolved in 100 parts water produce a lowering of temperature of 31.2° ; and 130 parts of the latter in 100 parts of water as much as 34.5° .

CLEANING AND RESTORATION OF OIL PAINTINGS.

[The cleaning and restoration of oil paintings is a trade in itself, often requiring great skill and experience for its successful practice. But as photographers frequently have oil paintings to copy which may be greatly improved for the purpose by a little treatment, the following extracts from a useful work we have before laid under contribution—*The Camera and Gilder's Guide*—will be found interesting. We would caution inexperienced persons, however, that it is very easy to spoil a painting, and I recommend a little practice on things of little value.—Ed. P.N.]

A few words on the preservation of pictures may not be out of place, as this little work may fall into the hands of those who possess many valuable works of art, who will be glad to receive a few hints on the subject.

Remarks on this subject would not be necessary in some countries, as exposed wall paintings in the Egyptian tombs are as fresh now as the day they were painted. This is attributed to the warm dry atmosphere, amongst other causes, which has preserved the colours in a brilliant condition for thousands of years.

In England the great cause of the deterioration of pictures is the cold damp atmosphere, so prevalent in our climate, and it is necessary where pictures are hung to occasionally air the rooms where they have been left some time without fire.

It need not be mentioned that it is ruinous to hang pictures on a damp wall, but where it is desirable to hang pictures on a wall generally damp, the wall must be lined with thin sheet lead, and papered over with damp-proof paper, before any pictures can be hung.

In a new house especial care should be exercised to make sure that all the walls are dry before trusting any pictures in the rooms.

Where a gallery is provided for the reception of pictures, proper means are used for ventilation and heat, and greater care can be bestowed upon them than is possible in a dwelling house, where, as in a dining room, the vapours from the dining table, and also from gas or oil lamps, are constantly at work at their deterioration; and when conservatories open into apartments, the damp must diffuse itself from the watering of the plants, the damp earth, and other causes. These in time exercise an influence on the pictures in the adjoining apartment, and slowly and insidiously work mischief if not keenly watched and guarded against.

With valuable oil paintings a sheet of colourless plate

glass securely placed in the frame, air-tight from the front and the picture placed so as not to touch the surface of the glass, and secured at the back to keep out the dust, &c. will be found to preserve its brilliancy of colour for number of years. There is an objection to glass oil paintings, as they cannot be viewed so well, owing to the reflection of the glass, but the advantages far outweigh the objection. It would be as well if both pictures and frames were covered up during the cleaning and dusting of the carpets and furniture, but the practice of covering up oil paintings for many months together during the absence of the owner cannot be recommended.

Frames should be regularly dusted with a feather duster. Oil paintings should be taken down at least once a year, the frames cleansed from dust, and also the back of the stretchers. The picture should then be carefully sponged with clean cold water till the dust and fly spots have disappeared. An old silk handkerchief then applied with moderate friction will be all that will be required. On no account use soap or any alkali.

With regard to water-colours, chromos, and engraving the glass should be pasted in the frame, and the picture would be better to stand back from the glass, when the dam and other vapours will not be likely to injure them. We have seen on very foggy days, where doors have been suffered to be open, the vapour condense on the glass and run down communicating with the picture behind, and leaving a stain on the margin. This should be guarded against.

Lining Oil Paintings.—The majority of oil paintings have canvas for a base, and are consequently liable to damage from the ravages of time and accident. A rotten canvas is a common thing, produced oftentimes by being hung in a damp place, and attacked by insects, which destroy the canvas, and, if wedged up in this condition, the result is a fracture across the painting. When pictures have thus progressed to decay, the only remedy is lining or laying down the picture on a new canvas back.

In the first place, clean off any old varnish or dirt that may have accumulated on the painting, so that when the operation is complete, the face of the picture may not be unnecessarily dampened. The picture should then be carefully cut from the old stretcher on which it has been tacked, and it should be then squared up on the four sides. A large smooth sheet of paper should then be pasted over the face of the picture, and if it is a large size, or the canvas very rotten, two or three sheets would be necessary to preserve the painting during the operation from damage. Sometime it will be found advantageous to paste the sheets of paper on the painting before it is cut from the frame, as it sometimes contracts and throws it out of shape. A very smooth table must then be used for the succeeding operations, and the picture laid down on its face, and the back well cleaned of dirt or any unevenness, which may carefully be done with a knife. The picture is then covered very evenly with glue and paste in equal quantities, and a little corrosive sublimate to prevent insects from attacking the canvas, and on a new canvas, quite two inches larger every way than the picture, must be evenly laid down. It must then be well rubbed down by the hand, using as much pressure as possible to make every part adhere. When nearly dry, a heavy heated iron must be passed over the newly-laid canvas to make it perfectly smooth. It will be seen that a very smooth table is necessary, as by this operation every inequality will show on the picture. The iron must not be too hot, should be a good size, and at first be lightly passed over every part, and no heavy strokes on any one part be given, as the object is to bring the picture to an even surface. We have warned our readers not to have the iron too hot, and this caution will be found to be necessary, when the consequence would be a singed canvas and discolouration of the paint. Before using the iron, be careful, if the picture has been painted with thick masses of colour for effect, to lay some fine woollen cloth underneath it, or it will be damaged; but if the picture is smooth the cloth will not be required, nor the

iron so hot. An iron too cold will not effect the object required; the medium heat will best suit the purpose.

A new stretcher should be ready-made, out of dry deal, and it should have a cross-bar to keep the picture firm, and if a large picture, two or more should be used. The stretcher must be made nearly one inch larger both ways, so as to allow half-an-inch margin round the edges. The new canvas with the picture on it may now be laid on the stretcher, and evenly tacked round the edge in its place. Some will prefer to glue the picture round the edges, but with small subjects it is unimportant. When the picture has well hardened, the paper may be removed from the face with a damp sponge; and lastly, carefully rub the face with an old silk handkerchief to take off the last remains of the damp, and drive up the wedges.

Damaged Canvas.—Accidents sometimes occur whereby the canvas of a picture becomes torn or damaged, and it may not be desirable to line the picture. This may be repaired by laying the picture down on its face and fastening a piece of canvas at the back, which, if neatly done, will not show on the face of the picture. For this purpose lay powdered mastic between the canvases, when a hot iron will neatly join the two together. Some would use melted wax for the purpose, but the above will be found superior.

(To be continued.)

A NEW METHOD OF PREPARING CLICHES FOR MUSIC WITH THE AID OF PHOTO-LITHOGRAPHY.

M. ALISSOFF, OF ST. PETERSBURG, INVENTOR.*

At the present times there are two processes in use for the preparation of plates in the printing of music.

The first is like that used for the production of cliches for books, that is to say, the different signs or types used in musical typography have to be set one after another, so as to compose a complete musical stave. As each sign, however, is divided into several characters, this work is so long, and requires in the compositor so much practice and attention, that a cliche for music prepared according to this process is always very expensive.

The second process consists in engraving the notes on soft metallic plates. Although this is greatly facilitated and simplified by the use of special tools and punches, it requires in the engraver a particular skill, only to be acquired by well nigh life-long labour. And yet, even in the hands of the most skilful engraver, it progresses very slowly, as mistakes can only be avoided by the most extraordinary attention. It is difficult to correct minor errors, and those of greater importance—as, for instance, an omission, or a defective arrangement of the bars—is irreparable. In that case there is no alternative but to begin the whole page over again.

The composing process I employ for the printing of music greatly simplifies and accelerates the work.

It may be described as follows:—

Firstly, the staves, notes, and other signs used in music are printed on very thin unsized paper, and arranged in type-cases like ordinary metallic types. This done, the composition is set by simply pasting, first the staves, then the notes and signs, on a sheet of glass in accordance with the manuscript which is to be printed. These different characters have to be affixed to the glass with a gum which has the property of rendering the paper transparent. As a guide to the compositor, I place on the opposite side of the glass a sheet of paper, ruled closely with vertical and horizontal lines, with the aid of which it is very easy to space the bars properly, and to dispose the notes and musical signs on the staves with perfect regularity. More-

over, the characters made use of, being three or four times larger than ordinary musical signs, may be handled with great facility. When a page is set, the ruled sheet of paper is removed from the glass, and by means of photography (letting the light pass through the composition) a negative is taken, reducing the page to the desired size. From this negative it is easy to transfer the composition to stone, and to print, according to the usual photo-lithographic process, any number of copies required.

Should cliches be wanted, the composition would have to be transferred to zinc plates, prepared according to the ordinary method of helio-engraving.

The advantages of this process are the following:—

1. The work of composition for music is simplified to such a degree that no special compositors or engravers are needed; any one, even a child, may do it, after having but once seen it done. I may even say it is no longer a man's work, but rather a woman's.
2. When composing, any correction whatever may be made with remarkable facility and rapidity; the composer has but to unpaste the little piece of paper on which the error has been made, and he is thus under no necessity of beginning the whole page over again.
3. With the same composition stereotypes of any size whatever may be obtained.
4. A page of music printed by this process, far from being less perfect, is even superior to one printed by the ordinary method.
5. A person establishing a printing office according to my plan will avoid the considerable expense commonly incurred in the purchase not only of a stock of metallic signs and characters, but also of engraver's tools and punches.
6. This process may be used with success for the printing of titles in fancy letter, and ornamented with vignettes; and even for the printing of all names and words of maps and plans."

SOME STUDIO HINTS.

BY A BELGIAN SUBSCRIBER.

1. *Plate Cleaning.*—The best plate cleaning solution is the water in which potatoes have been boiled. In this water boil your glass plates, and rinse; you will find them much better cleaned than with soda or potass. Try it.
2. Never make your silver nitrate of pieces of silver which have been electro-gilded. This year we made some nitrate with fragments of a set of teeth gilded by galvanoplastic, expecting the silver to dissolve and leave the gold intact. But it was not so; and the gold seemed to be dissolved with the silver, as it was not visible in the nitrate. When the nitrate was used in the negative bath we tried and found the plate covered entirely with minute pinholes. The bath solution seemed clear and limpid, but when seen in the sun with a ray falling on the bottle, we saw thousands of minute atoms of gold reflecting and floating in the solution. Filtering was no cure; precipitating as carbonate, no cure; as a chloride the particles did not pass the filter, but rested on it. We then converted the bath into metallic silver by copper plates, as indicated by Captain Abney's Manual, and at the first conversion we still found gold in the nitrate.
3. The simplest way for amateurs of reducing silver wastes is to throw the silver containing solutions (except hypo) on sawdust mixed with ash of paper, and then place a Paris clay crucible with a little borax and nitrate of potass: the wood and nitrate of potass will form carbonate of potass (pearlash). When the flux is limpid as water, and black as jet, flow on dry sand; when cool, you will find pure silver. When the sawdust used is not sufficient to black the flux, put in the crucible a wood stick, which will set all right.

The Photographic News.

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THE EMULSION PROCESS IN FRANCE.

EXPERIMENTS IN THE FIELD.

It would seem that the emulsion process is finding considerable favour in France, and the award to M. Chardon of a Government prize for his method of preparing emulsion plates has further added an impetus to its popularity. At the last meeting of the French Photographic Society, M. Balaguy, an amateur, who seems to have produced a large number of successful pictures with the process, exhibited the results of his work to the members, and as his series of photographs were taken on large plates measuring twenty-seven by thirty-three centimetres, they naturally attracted considerable attention. M. Balaguy accompanied the presentation with some remarks which may be of interest to our readers, many of whom would be only too willing to dispense with the dipping bath if they could so with impunity.

"After the very interesting communication which M. Chardon has made to the Society in reference to his new process, and after the experiences of M. Andra, it is not surprising that an amateur should be seduced into trying them. The chief attraction of the emulsion process is the facility of preparation in regard to the production of the plates, for the photographer views with satisfaction the abandonment of all those laborious operations connected with the preparation of preservatives, their application to the collodion film, the washing operations, &c., with which he was previously troubled in producing dry plates. Neither must there be forgotten the inconvenience that arose from working ordinary collodion plates, the transport of baggage, the dust, and the many precautions necessary to the securing of a really satisfactory result. I used to employ either iodised tannin plates, or bromide of silver plates washed in a bath without any preservative. The results I secured therewith were satisfactory enough, but I must admit that the appearance in the field of the emulsion process has made me put on one side at once all these old-fashioned methods, which, in the midst of success, would frequently betray signs that they were not always to be depended upon for absolute security.

"Every year, about this time, it is my custom to make a little tour in the environs of Paris with a photographic apparatus, and I usually carry with me plates which have been carefully prepared by myself in my own laboratory. I stay out until I have exhausted my supply, and then put my apparatus together and return home to count up my gains. This year my outfit consisted simply of some ordinary glass plates, and two bottles of emulsion, of which half still remains. I owe my thanks to M. A.

Chardon for having been able to effect this little revolution in my photographic arrangements, and all will agree with me as to the agreeableness of dry plate photography, in which all that is laborious and time-taking in the preparation of preservatives, &c., is avoided altogether.

"The emulsion I have made use of was prepared in the same way as all other emulsions. I have not, perhaps, followed the formulæ so closely as I should have done; in fact, I have put a great excess of silver in all the emulsion which I have used. This silver—or nitrate of silver, rather—being free, and having nothing to do, as a matter of course disappeared in the successive washings to which the emulsion was subjected. I fully believe that it is this excess of silver which imparts to the film its matt appearance; while M. Chardon, on the other hand, prefers to secure a collodion plate with a brilliant surface. Save in this respect, my emulsion is similar.

"All the plates which I have the honour to exhibit to you this evening have been prepared (or, in other words, the emulsion was applied to the plate) at a distance from home, at an inn or hotel. The latter was never far from the place at which the plates were to be exposed, but, at any rate, under unfavourable circumstances, for I desired that my work should be executed under conditions sufficient to test it. Add to this that at Barbizon, where these plates were exposed, there was at the time an Indian temperature, the emulsion was warm, and on being applied to the glass it naturally (being solvent) evaporated very quickly, producing the waves and unevenness which appear on some of the plates, it will be conceded by all that the conditions were not really good, although for making an experiment they were not bad either.

The first five plates prepared after the bottle had been uncorked gave very pretty pictures, although the film is torn in some places. One of these I exhibit this evening. I attribute the tearing to too large a quantity of ether in the emulsion, which composed half of the solvent employed to dissolve the pellicle. I have the more reason to believe this, since in the second batch of emulsion which I prepared the defect has not shown itself; in this case some of the ether evaporated, and the emulsion was in this way thickened in a measure. The pyroxyline may also have been in some degree the cause of non-success. Upon this point I recommend emulsion workers to follow more implicitly M. Chardon's formula. Nevertheless, I may remark that in case the operator is troubled with tearing of the film, this defect may be overcome by the employment of india-rubber cement along the borders of the cliché prior to development.

In my work I employed a camera measuring twenty-seven by forty-three centimetres, using plates of almost the same size, together with a large wide-angle lens of Dallmeyer's, No. 5. Some of the pictures I show could not be taken with morning light, unfortunately, from the fact that they were unfavourably lighted in the forenoon. My collection, for this reason, contains plates which were exposed at every hour of the day. The picture of a fir-wood was taken at a quarter past six in the evening, and for this reason is rather wanting in detail; another with foliage was exposed at eight o'clock in the morning. But then the latter was fully exposed with a period of two minutes and a half, while the evening pictures with the fir had no less than twenty minutes given to it. Therefore the exposures, which were governed in a measure by the size of the diaphragm, lasted from two minutes to twenty in the extreme case. All the pictures I have taken are landscapes, and include tree studies, rocks &c. Some of the clichés are a little hard, but as the blacks are transparent they will print very harmoniously.

"If you will give me a little more of your time, gentlemen, I shall have much pleasure in developing in your presence, in the same way as I did on my journey, a plate which was exposed at Barbizon a week ago, with the object, indeed, of being manipulated before you this

evening. Being desirous, before everything, of suppressing all manipulations connected with photography which might be embarrassing *en voyage*, I omitted to wash my plates with alcohol before developing them, for this operation renders a second necessary—that of washing the plate again after having applied the alcohol.

"As soon as the plate is taken out of the frame, I put it into a dish, and pour upon it a solution of carbonate of ammonia, made up—

Water...	...	...	1 litre
Carbonate of ammonia	30 grammes;

to which is added—

Bromide of potassium	3 grammes.
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"As soon as the plate has been flooded with this, and has become thoroughly moistened, I pour off the liquid into a developing cup, and add some concentrated pyrogallie acid solution in alcohol. The moistened image should become developed by degrees. To intensify, it is sufficient to renew the solution of carbonate and pyrogallie acid. If the image appears hard by reason of a lack of pose, it is well, as M. Davanne has indicated, to add a little saccharate of lime to the developer. In this way the desired value may be given to the cliché.

"The development may also be by a solution made up of—

Pyrogallie acid	...	...	4 grammes
Bromide of potassium	...	...	2 "
Water	...	...	1000 cub. cents.

"This first liquid serves to moisten the plate; by adding a little of a saturated solution of carbonate of ammonia, the cliché begins to develop. In this case intensifying with silver solution may be resorted to, and will be found to give good results.

"My plates are fixed with a solution of hyposulphite of soda.

"In conclusion, I may remark, that the interest felt in the emulsion process is proved by the attention given by photographers of late to recent improvements in this direction. The fact that the process permits us to suspend many of our old manipulations, and at the same time to work without a silver bath, is sufficient to ensure for emulsions a place in the future of photography."

IMPURITIES IN THE SILVER BATH.

SOME discussion has recently taken place among the members of the Berlin Society for the Advancement of Photography anent the impurities of the silver bath—or, rather, of nitrate of silver. It was suggested in the course of the discussion that the defects forming the subject of complaint were due to the distilled water rather than to the silver, the former, when purchased commercially, being frequently of an objectionable character, and far from pure. This reproach against the ordinary distilled water of commerce will receive support in this country, for water is often sold by chemists and druggists with us which contains a large quantity of sediment and organic matter, emanating, in all probability, from the receptacles in which the distilled water has been kept. No doubt photographers who derive their sources of supply in this way will do well to consider this element of risk in the preparation of their silver baths when the latter are out of order; but still, difficulties which arise from this cause are far more easily got over than those which arise from impurities in the nitrate of silver.

One reason why our nitrate of silver is sometimes impure is because the metallic silver employed for the preparation of the salt contains elements which are not altogether separated on the dissolution of the silver in nitric acid and the subsequent crystallization of the salt. Again, it is asserted by some photographers that the nitrate of silver is carelessly crystallized and washed, and has adhering

to it impurities from the mother liquor, and these tell us that they can never trust to the nitrate of silver they purchase, but have to go through the process of dissolving the salt and recrystallizing it again. With us, it is found that the salt usually obtained in commerce is unfit for the preparation of nitrate baths, and it is only the more expensive product—the fused or recrystallized—which is to be trusted in the making up of a silver bath.

Our Berlin friends, it seems, complain more especially of lead as an impurity in nitrate of silver, and Dr. Vogel has published some directions as to the tracing of this impurity in the silver salt. The President of the Society recommends the dissolution of one part of the silver salt in two hundred parts of water, and the adding to the clarified and filtered solution some Glauber salts solution, free from chlorine. If lead be present, a very marked turbidity is the result by the formation of sulphate of lead. Another, but less delicate test, consists in dissolving the nitrate of silver in a little water and adding ammonia to the solution. A precipitate results, which, on the addition of yet more ammonia, is dissolved again. If, however, lead is present, a turbidity will still remain, even after an excessive addition of ammonia. To separate the lead, the following plan might answer. One-tenth of the nitrate to be purified is dissolved, the silver oxide being precipitated by means of alkali. The remainder of the nitrate, dissolved in water, is boiled for half an hour with the oxide of silver, separated by filtration from the other solution, and this oxide will then, in all probability, precipitate the lead contained in the larger solution. Dr. Vogel had not, he said, practically essayed this method of operating, but it answered very well, he averred, for separating copper from silver. Lead did not, happily, interfere much with photographic operations, but in this form was to be regarded as an adulteration rather than anything else, a costly metal being mixed with one of little value.

It has been the custom in some studios to add lead to the silver bath in the form of sugar of lead or acetate of lead, for what reason is not quite clear. But to recover the silver from old baths, the solution used frequently to be treated first of all with sulphuric acid, in order to separate the lead compounds from the silver residues. The addition of sulphuric acid to the bath, under ordinary circumstances, is, however, fraught with many evil consequences. The acid will produce upon the plates innumerable pinholes, the result of sulphate of silver crystallizing out upon the collodion film. The slightest trace of acid will produce evil effects, and utensils which have previously contained it will frequently cause defects of the kind, even when the precaution has been taken to wash them with some care.

M. ROUSSELON'S PHOTO-GRAVURE PROCESS.

M. ROUSSELON, as the photographic world is well aware, has succeeded in producing some very good work by a process of photo-gravure. A portrait of M. Davanne, the Vice-President of the French Photographic Society, which was published some time ago in the *Bulletin*, was a most excellent picture, and there cannot be a doubt that to M. Rousselon belongs a great deal of credit indeed for the manner in which he has elaborated and improved the photo-gravure method, by which these fine results were obtained.

It is not, however, so certain that the principle upon which the process is based is the discovery of M. Rousselon himself. Many may think this is of little importance, since the fact remains that M. Rousselon can produce good work, while others are less competent to do so. And this, doubtless, is a good common sense view of the matter; we only wish that M. Rousselon were content to take it. Unfortunately, this is not so. In the last edition of the *Bulletin* there appears a distinct claim from M. Rousselon to have been the discoverer of a

chemical means of imparting granulation in the photo-engraved block, another French experimentalist, M. Placet, having, it seems, put himself forward as the one to whom such honour is due. Now, according to Mr. Woodbury, it is neither M. Placet nor M. Rousselon, who is the discoverer, the first having repeatedly laid claim to the invention in these columns. Mr. Woodbury has told us over and over again that the suggestion to impart grain to his photo-relief images, and thus secure prints in fatty ink from an engraved plate, came from himself, and M. Rousselon has never denied the fact; and Mr. Woodbury has further pointed out that while medal after medal has been awarded to the French experimentalist, the latter has never ventured to mention the principles upon which his photo-gravure process was based. M. Rousselon is the principal of MM. Goupil's photographic establishment at Asnières, where the Woodbury photo-relief process is so much employed; and Mr. Woodbury, it seems, supplied the latter with much information connected with applications of the process, not omitting the means of imparting to the gelatine matrix a certain grain.

We should have been well content to let the matter remain as it was, since it is very probable, indeed, that in M. Rousselon's photo-gravure process as much depends upon nicety of manipulation and upon the improvements which M. Rousselon has contributed, as upon the principles of the process. But as M. Rousselon has now come forward to claim the principle from another, we think it is high time that the matter should be clearly set out before the public. If M. Rousselon does not employ Mr. Woodbury's modification of the photo-relief process, what motive can he have for claiming to be discoverer of introducing grain by chemical means? We append M. Rousselon's letter in which he sets up this extraordinary claim.

"To the President,—In the *Bulletin de la Société Française de Photographie*, No. 5, I find a long article by M. Placet, in which he indicates the processes he has patented to obtain photo-engraved plates by means of photography. The terms of this specification are so very general that it may be said that he reserves, as being his property, all means to obtain a chemical grain, whatever the mode of operating or substances employed. I therefore address you, sir, the President, believing that it is necessary to protest against such an encroachment upon my incontestable rights in having discovered chemical means to obtain grain in engraved plates obtained by the aid of photography. This discovery has already brought me in awards from Vienna, Brussels, London, and Paris.

"Without desiring to judge or discuss the value of M. Placet's process, whose interesting work I am far from denying, it would be unjust, it seems to me, that in a few years' time, with the support of the article in the *Bulletin* in question, if it were possible for M. Placet to be in a position to claim priority of invention.

"I count, Mr. President, upon your high impartiality to allow me to make this reclamation.—Receive, &c.,

"H. ROUSSELOX."

A DANGER TO BE GUARDED AGAINST.

An experienced chemist and photographer sends the following timely hint.

"Now that so many persons are experimenting with alkaline development, a danger of fog arises from the escape into the atmosphere of ammonia vapour when such experimentation goes on in the same dark room in which the wet process with bath and iron developer is also being practised.

"In order to avoid this danger, it is imperative, before preparing and developing plates in the ordinary manner, after plates have been developed by the alkaline method, that the air of the dark room should be completely changed by ample ventilation, or neutralized by the sprinkling on the floor, &c., of acetic acid."

FRENCH CORRESPONDENCE.

HOLIDAY TIME—GOUGENHEIM'S COLLODION: FAVOURABLE REPORTS BY MM. ANDRA AND JOLIOT—SULPHATE OF COPPER IN THE DEVELOPER—DESPAQUIS' COLLOTYPE PROCESS—REASONS FOR EMPLOYING GLASS INSTEAD OF METAL.

HOLIDAYS have already commenced in the case of those whose business or connections do not keep them in Paris. The meeting of the Society on the 3rd August, which was the last of the session, was on this account not very numerously attended.

In giving an account of the former meeting, we stated that M. Gougenheim communicated the formula of a rapid collodion, and also placed in the hands of the President some samples of the material for trial by any who desired to make experiment with it. On the present occasion M. Andra gave some account of his success with the collodion, and exhibited to the members some of the clichés which he had obtained. He declared that the collodion seemed to him excellent in every respect, and he added that for his part he had never encountered a better. These were his own words.

As to the developer, which my readers will recollect contains sulphate of copper, M. Andra stated that he did not find it, so far as rapidity is concerned, possessed of any advantages. He found that he secured results quite as readily by suppressing the use of the copper in the formula indicated by M. Gougenheim. M. Andra affirmed, indeed, that the copper salt, on the contrary, acted as a restrainer or moderator, the term M. Boivin employs for the bromide in alkaline development.

Another member (M. Joliot, the successor of the famous firm of Lejeune et Levitaky) tried the collodion of M. Gougenheim, and he also reported favourably upon it. He agreed with M. Andra, that addition of sulphate of copper to the developer did not seem to have much influence upon its action. At the same time M. Joliot made the same remark with regard to the Boissonas process, of which he possesses the right to practice at Paris. In this process the same salt is set down in the development formula, but its suppression does not materially alter the results obtained.

M. Despaquis forwards me some details of his photo-mechanical process in greasy ink. This process is based upon the double exposure of the gelatine; that is to say, after the plate covered with gelatine is put under a cliché in the ordinary manner, the former is turned round and exposed to light a second time from the back, until the action of the rays have met together. A glass plate, by reason of its transparency, is specially adapted for the vehicle of the gelatine, and it is upon the latter that the printing is done, in the same way as Albert, of Munich, and others proceed. Thanks to its supple character when wet, the film of gelatine is less open to injury than even steel, and it permits of a much larger number of impressions being taken than if it were metal. Other reasons are in favour of the printing being direct from the gelatine. Gelatine will not adhere to a polished metal surface, and will adhere but slightly if it is grained. To work a grained copper plate, the same must be coated with a thin film of gelatine, so that the large transparent portions of the clichés allow the light to pass as far as the metal itself, and in this case the grain of the copper is entirely reproduced upon the image, giving the latter a very disagreeable appearance; only a limited supply of copies can be struck off in this case, and these are of a defective nature. If the film of gelatine is a thick one, the grain is less apparent, but then but a very few prints can be pulled, because of the tendency of the gelatine to swell up when moistened.

Even with the process of M. Despaquis (exposure of the film to light on both sides) it is necessary to employ polished plates. No matter how finely a glass is grained, the grain always appears upon the print in the end, and takes away from its delicacy. One other condition is indispensable to

success : it is necessary that the film of gelatine upon the glass should be of uniform thickness throughout. The manner of operating adopted by M. Despaquis is as follows:—After the gelatinized plates have been exposed to light from the back, as M. Albert, of Munich, recommends, they are placed in a perfectly horizontal position in the drying cupboard, employing a water level to ascertain if this is the case. A solution composed in the undermentioned proportions is, in the meantime, prepared, namely:—

Ordinary water	...	1000 cubic centimetres
Strong gelatine	...	25 to 30 grammes
Bichromate of ammonia	...	6 to 7 „

The bichromate is dissolved in one hundred cubic centimetres of the water, and then the remaining nine hundred are added in which the gelatine has been previously dissolved. The filtration of the liquid is conducted by means of paper or fine linen. The drying chamber is warmed so that the gelatine surface should not set before it has become perfectly level, a result which might happen if the chamber were cold. Then the solution is poured upon the plates in such a way that the superfluous liquid escapes at the margins, and leaves a perfectly uniform film. So that the fluid may run the more uniformly, it is well to wet the margins of the plate by passing the finger along them. When this second film has dried, you may then proceed without fear to expose the plate a second time under the cliché. The process, in a word, resembles very much that of M. Albert, of Munich, but there are some important differences of detail which are said to have much influence upon the result.

ERNEST LACAN.

PHOTOGRAPHY IN AMERICA.

BY NORMAN MAY.*

As salaries are what the intending emigrant generally thinks of most, I will give a few cases that came under my own immediate observation, and which I can guarantee as being absolutely correct. I have not heard so much about the prospects in America lately, but three or four years ago I know there was an idea that exorbitant salaries were paid, especially to retouchers. I knew a retoucher in the West of England who at that time was getting £4 a week, and yet was dissatisfied, as he had been assured he could get at least thirty-five dollars, or about £7 a week, in New York, or any large city in the Union; but at that very time a photographer in Detroit, whose pictures were universally praised for the splendid retouching, was only paying two dollars a day, or about forty-eight shillings a week, to the retoucher, who was quite satisfied with his salary. Very high-flown accounts are often sent home from America, generally to relieve friends from anxiety. I knew of a young fellow, then in New York, who wrote to his parents in England, and, giving his address as Ward's Island, where there is a refuge for destitute emigrants, he gave them to understand that he was a clerk in the establishment, not liking to worry them by saying he was an inmate; but he was, though, and he stayed there some months, during which time he used to write home telling them he was very comfortable, and getting on well, but was afraid it was not a very permanent situation. That kind of thing is very pardonable in such cases, but still it is apt to mislead people who think of emigrating, and I know the accounts sent home sometimes are, to put it mildly, a little exaggerated. We will just suppose this retoucher could have got £7 a week in New York, how much better off would he be than on £4 in England? The necessities of life are much dearer, and, taking it altogether, he would find he had made a mistake, even at that salary. Twelve dollars are thought a very fair salary; there may be instances of more being paid, but still the average would certainly not be above that. A Canadian operator, whom I knew well, had twelve dollars a week,

and that, also, was thought first class pay there. The same man would have no difficulty in getting £3 or £4 in England. In addition to being an excellent operator, no one, I know, could equal him in suavity of manner and the tact with which he understood and managed his sitters. His knowledge of human nature was great, and had been improved by travelling, and customers went away pleased with him and themselves, feeling sure they would like their pictures. Such operators are by no means common anywhere.

I knew other operators in Canada who didn't get over six or eight dollars a week; average sort of men; they were such as would get thirty-five shillings or £2 in England. One operator I knew was paid seven dollars a week, but his employer not doing enough business, he obtained a situation elsewhere at five dollars. He was a very steady married man, and had been in business for himself. A printer's pay would be five or six dollars, up to nine or ten dollars for a first class one. Lads of seventeen or eighteen got three and four dollars a week as printers. I knew a very good printer, who was also a fair operator; I am not quite sure what his salary was, but the last I saw of him was in Detroit, engaged in the intellectual employment of varnishing bedsteads for a furniture manufacturer. Nine dollars, or about thirty-five shillings, he got for that; but it was evidently an improvement on photography as far as salaries were concerned.

There was a good general assistant, a man about fifty, who had been in business at Cape Colony; he was getting six dollars in Canada, which he said suffered in comparison with the Cape. A decent colourist got eight dollars; but even that didn't last through the winter, and he was obliged to seek fresh fields and pastures new.

All these mentioned were well spoken, intelligent fellows, such as would find ready employment in England at good pay. I've noticed lately several advertisements from operators and retouchers who have just returned from America, so they evidently didn't find it up to their expectations. Colourists are rather at a discount. I was shown some cabinets very nicely tinted, in Chicago, for which the munificent sum of twenty-five cents, or one shilling, was paid. A Canadian photographer who visited me a short time since expressed himself greatly pleased with the state of photography in England, and thought seriously of selling his business and settling in the "old country," not only on account of the improved prospect for making money, but for the better education of his children. He is an extremely well informed man, and has ample opportunity of judging the merits and demerits of the respective countries.

In winter the photographer has many competent assistants who are willing to work for their board. In all branches of photography the competition seems so great that wages are kept very low indeed in proportion to the mechanical businesses, and compared with England, taking into consideration the purchasing power of money in the two countries.

I am afraid that these remarks will be thought discouraging to the intending emigrant, but I write only of cases that came under my own observation, and, perhaps, others can give a more flattering account.

(To be continued.)

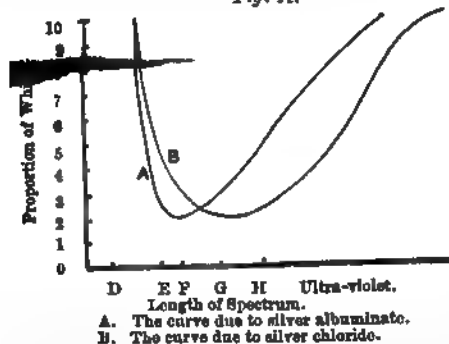
ON THE DEPTH OF PRINTS AND INTENSITY OF NEGATIVES.

BY CAPTAIN ABNEY, R.E., F.R.S.*

IN continuation of the last communication I propose to show the action of the spectrum on albuminate of silver and silver chloride. In order to obtain the prints, a spectrum was formed by sending a slice of white light, after passing through a collimating lens, through one flint glass

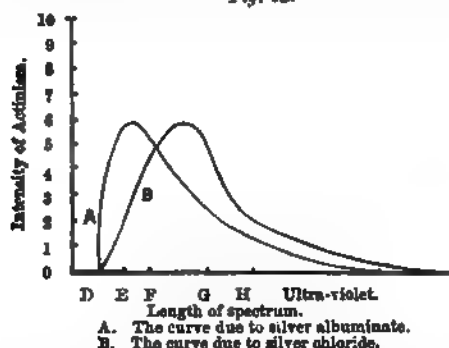
prism. The light was received on a lens of six feet focus, and a bright spectrum thrown at that distance from it on the sensitive sorts under examination. As it would have been nearly impossible to measure the depth of printing had the slit been so narrowed that all the fine lines had been shown, the slit was opened to such a point that only the principal lines were visible, and these were left to serve as an index to the position of the different intensities. A sensitive plate was finally exposed with a very fine slit, all the apparatus remaining untouched, and a print taken from it in order to fix more definitely the position of the intermediate intensities. The accompanying diagram gives the results obtained.

Fig. 11.



At first sight it seems to be merely a record of black and white, and not of sensitiveness. If, however, it is translated into intensity of actinic power the significance is at once seen. This has been done in the next diagram.

Fig. 12.



The sensitiveness of the chloride of silver and the albuminate both commence at the same ray of the spectrum. The point of maximum intensity of the former is at G, and of the latter about F in the solar spectrum. Now this must not be received as an absolute result of the necessary sensitiveness of these salts to the various coloured rays, but simply the sensitiveness for *printing purposes*.

This is no unnecessary distinction, for with development before the colour of the compound has changed it would be found that the points of maximum sensitiveness would be altered. The reason is apparent. The silver albuminate and chloride both have distinctive colours where acted upon by light, as already pointed out, and the colour of the former is such that for equal thicknesses more of the blue and violet are cut off than in the latter; hence the greater comparative depth of black produced towards the green in the former than in the latter.

I might have exemplified this at a greater length had I given diagrams showing the difference that occurs in the points of maximum intensity produced by placing in front of the slit of the spectroscopes in the case of albuminate of silver a film of darkened albuminate, and in the case of silver chloride a plate covered with darkened chloride. It would have been noticed that whilst the

point of maximum intensity in the latter remained nearly in the same position as it does at present, that that of the former shifted further towards the green. It may be objected that the films of albuminate and chloride exposed to the spectrum are thin, and cannot, therefore, have appreciable effect. The result of this last experiment proves that it has, as might also be surmised by the mere fact that blackening of a film must alter the conditions of light acting on the sensitive surface at any instant; and, again, it must be borne in mind that thinness of a film is only a relative expression. Thus a film of silver or gold which is almost too thin to measure will cut off nearly all light, and, therefore, in this respect, may be considered a very thick film. In reference to this subject it may not be uninteresting to remark that the late Sir John Herschel and Mr. R. Hunt carried out a great many experiments on the sensitiveness of various salts, the rays of the spectrum to which they were sensitive, and points of maximum sensibility being determined by them. In those cases where the results were arrived at by exposing the salts to the spectrum sufficiently long to print, a correction might have to be applied dependent on the absorption produced by the colouration.

It is scarcely needful to make any further comment on the lesson to be learnt from this portion of the subject, except that it still further shows the modification that can be made in a print by altering the proportion of albumen to chloride in albumenized paper.

For curiosity sake, I have taken two silver prints, one of rich brown tone, and the other of a black tone, and compared the deepest shades and highest lights with the standard shades. The following are the results:—

	Blue-black Print.	Brown Print.
Highest light	9.3	9.1
Medium light	7.0	6.6
Medium shadow	2.2	2.8
Deepest shadow	.5	.8

Proceedings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

On Thursday, August 2nd, the Board of Management of the above Association met.

The minutes of previous meeting having been read and confirmed, Mr. James Henderson was elected an ordinary member of the Association.

A new edition of the rules having been printed, it was decided to send them post free for six stamps (see advt). Several alterations having taken place, it is considered advisable for all members to possess the latest edition. All information concerning the Association will be found in this book.

The next meeting will take place on Thursday, September 6th.

FRENCH PHOTOGRAPHIC SOCIETY.

A MEETING of the Society was held on the 6th inst., M. DAVANNE in the chair.

A letter from the Minister of Public Instruction was read, stating that he would be glad to help the Society as far as possible in respect to the improving of photographic apparatus for travelling purposes.

The Commission charged to examine M. Chardon's emulsion process stated that, with a view to ascertain the keeping qualities of the plates, a case had been forwarded to Shanghai, containing emulsion and prepared plates, some of which had been exposed. On the return of the box from China in four or five months an examination will be made and report furnished by MM. Andra, Chardon, and Davanne.

M. ROUSSELOU addressed to the Society a note claiming for himself the honour of priority in inventing a means for securing grain in photogravure which has been claimed by M. Placet (see page 379).

M. TURPIN exhibited to the Society several compounds of rubber, among which were an india-rubber parchment and a material termed vegetable ivory.

M. WEITENBERG (of Marburg, recommendation to employ

finely ground resin for retouching was brought before the Society.

M. LOEFFER, an American gentleman, having stated that the time necessary for printing a carbon print is the same exactly as that taken to produce a silver print (before toning and fixing), and that, therefore, a cliché with silver paper might well serve as a photometer, MM. Liebert and Franck de Villecholle remarked that such is far from being the case, since carbon tissue is much more rapid to print than albumenized paper, and, moreover, its rapidity varies with its preparation. A photometer is, therefore, necessary to measure the sensitiveness of the preparation.

The SECRETARY acknowledged from Dr. Van Monckhoven a pamphlet on the reproduction by means of photography of the ultra-violet spectrum of gases, from Dr. Liesegang's *der Kohle Druck*.

M. TRUAN, of Gijon (Spain), presented the Society with fine impressions in permanent pigments by a simplified method of printing.

M. MERCIER exhibited an instrument for adjustment to the camera, which had for its object to secure images of coloured subjects with their relative degrees of light and shade.

M. MAGNY exhibited a series of fine pictures secured with plates prepared by M. Chardon's emulsion process.

M. SCHAEFFNER showed samples of photo-lithographic paper prepared by M. Husnik, of Prague, and explained the manner in which it was used.

M. BRAUN passed round a fine collection of prints, being reproductions of the principal paintings of the *Salon* of 1877.

M. GOUGHENHEIM placed at the disposal of the Society some samples of rapid collodion, of which he gave the composition as under:—

Ether	...	...	...	585 grammes
Alcohol at 40°	...	...	...	465 "
Pyroxyline	...	...	...	10 "
Double iodide of potassium and cadmium	...	...	...	5 "
Iodide of ammonium	...	...	...	4 "
Iodide of cadmium	...	...	...	2.50 "
Bromide of cadmium	...	...	...	3 "

M. BARDY gave an account of his experiments on the employment of artificial colouring matters as anti-photogenic agents; also some details on the preparation of emulsions.

GENERAL WINBERG, Director of the State Paper Department in Russia, forwarded some specimens of photo-gravure intended to serve as models in schools of design.

M. BALAGUY presented to the Society a number of clichés of large dimensions, 27 by 33 centimetres, obtained by the emulsion process. M. Balaguy said:—The emulsion I employed was made in the same way as other emulsions, although I was not, perhaps, so careful in following the formulæ as I might have been. I always put a great excess of silver in my emulsion. This silver, or rather nitrate of silver, remaining free, was of course washed out when the emulsion was subjected to the washing process. I believe this excess of silver gives my emulsion a matt surface, while M. Chardon prefers to have one with a brilliant surface. In other respects my emulsion has nothing remarkable about it. The development of the plates was similar to that usually had recourse to.

The proceedings then terminated.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

A MEETING of this Society was held on June 5th, President H. J. NEWTON in the chair.

The minutes of the last meeting were read and approved.

A communication was read from the Glasgow Photographic Association, requesting the Section to use its influence in opposing the extension of the patent for Swan's carbon printing process, which patent was to expire in February, 1878.

The PRESIDENT remarked that in America they were not so much interested in the Swan process as they were in Europe. He did not know of anyone using that system to any great extent, and it was therefore doubtful whether an application would be made for its extension. Perhaps the best way would be to appoint a committee to take the subject of the letter into consideration.

On motion, Messrs. Duchochois, Mason, and Bierstadt were appointed a committee for that purpose.

Mr. DUCHOCHOIS said that as one of the committee on experiments he would state that he found a solution of one per cent. of alum would prevent bubbles or blistering in prints. He used double albumenized paper.

The PRESIDENT remarked that he tried alum some time since, and observed that it impaired the white parts of the print. He found a few drops of ammonia in the fixing solution to answer better than the alum.

Mr. LAUDY exhibited negatives and positives of the same pictures, and views taken by the usual bath process, also duplicates by Newton's emulsion, which were carefully examined and duly criticised.

On motion of Mr. DUCHOCHOIS, M. le Comte de Damsaux, a member of the Belgian Photographic Society, was elected a corresponding member of the Section, and the Secretary was instructed to notify Mr. Damsaux of the same.

On motion of Mr. GARDNER, a committee consisting of Messrs. Gardner, Mason, and Chapman were appointed to procure more commodious rooms for the meetings of the Section in the Fall.

An exhibition of slides was then given with Mr. Wilson's stereopticon, Messrs. Laudy, Newton, and Chapman showing some very fine views made by them. Mr. Wilson also exhibited several beautiful coloured slides.

On motion of Mr. CHAPMAN, the minutes of the meeting were to be placed in charge of the clerk of the Institute for thirty days, so that the members of the Section could examine and correct them if necessary, as the usual summer recess was about to be taken, and the publication of the proceedings might be desirable before the first Fall meeting.

The Section then adjourned to the first Tuesday in September.

Talk in the Studio.

THE FORTHCOMING EXHIBITION.—We have reason to hope, from what we hear, that the next Exhibition of the Photographic Society will be a good one. Some who have not contributed for years will send this year. Mr. H. P. Robinson, who has not exhibited now for four years, will again contribute one of the fine compositions which have made his work famous. The subject is entitled "After the Day's Work is Done": a cottage interior in the evening tide, with an elderly labourer reading the big Bible, whilst his wife listens. It is a noble composition, singularly successful in rendering the difficult light and shade of a cottage interior lighted by one small window.

WHAT ARE THE ART RIGHTS OF PHOTOGRAPHERS?—The Philadelphia *Public Ledger*, referring to the recent copying of one of Mr. Robinson's photographs, says the rights of photographers constitute "a question not yet specifically settled either in law or in the comity of the great fraternity of art, some even being disposed to deny that photography is an art, or that its products are art works. A sharp issue under this question has just been raised in England. An artist, a painter, recently exhibited in the Dudley Gallery, where 'copies' are not admitted, a copy of a photograph of the sea by Mr. H. P. Robinson, of Tunbridge Wells, who is also a painter as well as photographer. Mr. Robinson demanded that he should be credited with having made the original picture, and there has been considerable correspondence between the two artists and the committee of the Gallery on the subject. Mr. Robinson claims that the composition, lighting, and sentiment of the picture are his work, although he used a chemical process instead of his hands to fix the scene on paper, and he presents a knotty point for the committee when he suggests to them that if he had copied his photograph in oil and sent the picture to them they would have had to decide whether Mr. Macbeth's copy or his own was the 'original.' He thinks that there can be no question that the photograph is the original, and that both the paintings should be classed as copies. But if the photograph is an 'art-work,' as this would imply, artists who copy photographs should give credit to the photographers whose works they copy, just as the photographers now give credit to painters from whom they copy. There can be no doubt that a photographer may produce a picture of artistic worth in composition, lighting, sentiment, &c. (albeit he seldom does so), and the work of fixing it on paper by the aid of the camera is no more 'mechanical' than is the manual work of drawing and painting as done by most artists. It will be a safe thing to admit photographers to the fraternity of true artists whenever their works show them to be artists, for this course will not unduly swell the ranks of 'the heaven-born,' and yet will set before the working photographer a goal to stimulate his ambition."

YELLOW LIGHT.—Dr. Robert Charles Croft (204, Camden Road, N.W.) writes:—"The letters upon yellow light which

have appeared in the *Daily News* seem to have excited so much attention that I will ask you to be good enough to allow me to say a word or two more. Light transmitted through a yellow medium loses its chemical power. To this fact we are indebted for all the wonderful results in photography, since, when the window is covered by a yellow blind, the most delicate chemical operations may be carried on without being affected by the light so filtered. That yellow light has a considerable influence in abating the force and in reducing the irritation in small-pox I have had occasion to know. May it not have a similar effect in allaying the suffering caused by inflamed eyes? I saw at the sea-side yesterday some young ladies with delicate skins who were suffering greatly from being severely sunburnt, and I have no doubt that at this season of the year many persons suffer in a similar manner much pain. May I suggest that all this may be done away with by wearing yellow gauze instead of brown or green veils, and that yellow spectacles are far more likely to mitigate the glare of light than green or blue ones, especially the latter, which intensify and increase the actinic or chemical powers of light to a great extent? These matters are worth noting. Surely the worthy Doctor is in error in supposing that because yellow light is without chemical action, its glare will not be offensive to tender eyes!—Ed. P.N.

To Correspondents.

AN AMATEUR.—We have not heard of any similar defect resulting from adding nitrate of baryta to the bath. As you have added more than has generally been found necessary, possibly the minute irregular holes may be due to that. Half the quantity would have been sufficient. At present, the use of the baryta salt is based rather upon observation of its practical effect than upon any theoretical basis: its operation under different conditions will require continued observation and experiment to determine results with certainty and accuracy. When first used to get rid of pinholes, it was on the theory that the cause of these pinholes was the presence of sulphate of silver: but as it seems to prevent pinholes in many cases where there is no reason to apprehend the presence of sulphate of silver, its precise action remains at present unknown. A portion of the baryta may be removed by precipitation if you add a few drops of sulphuric acid to the bath, and filter out the sulphate of baryta thrown down.

A. CONSTANT READER.—It is difficult, perhaps impossible, to produce as good a portrait by means of artificial light as by daylight, but a pretty good portrait may be secured. 2. The magnesium light is the best—indeed, the only—really available artificial light for the purpose. 3. Details of cost of apparatus and working can be obtained by writing to Mr. Solomon, Red Lion Square, who supplies the lamp and the magnesium ribbon.

A. C. DOWN.—Your translation of the proportions is sufficiently accurate. We have never used this precise developer, and cannot with certainty say how it will work. We have employed tartaric acid, and did not like it, as we found it retarded development, and gave a thin blue image. We prefer acetic acid. *b.* Bichloride of mercury is used for intensifying in various ways. If a five-grain solution of the mercury salt be applied to a fixed and washed negative for a short time, until the surface colour is of a uniform dark grey, the negative will be found to have gained a little in intensity. If it be washed well, and then a one-grain solution of iodide of potassium applied, the negative will acquire a light olive tint, which is very non-actinic, and considerable intensity will have been gained. If, instead of the iodide, a very weak solution of ammonia or of hypo be applied, the negative will become black. There are various other modes of using the mercury salt, which have been described in our *YEAR-BOOKS*, but we do not, as a rule, recommend these intensifiers, as the negatives are apt to change afterwards. *c.* We have published in former volumes all the details to which you refer. You will see that we cannot with propriety often repeat such things, in justice to earlier subscribers who preserve their volumes. If you wish for details regarding any particular chemical we can give you brief details. *d.* It is desirable that the dark slide should be sufficiently large for each plate to be placed in and taken out easily; but it is unpardonable that dry plates should be so much below size as to drop through the slide. In such a case the plate should be made good by the vendor.

B. HARLEY.—You omit a most important element in the case. You do not state the size required in the photograph of the monument. The performance of the lens, as you describe it, does not seem very good; but it may be much better when used with a small stop, which is desirable when photographing the monument. Of the lenses you name, No. 1 is preferable.

J. H. R.—The landscapes are exceedingly good and interesting. We are glad to see one of the negatives; the technical qualities and the colour are very excellent.

B. R.—The alum bath for preventing blisters has been found successful in the United States. It is described as follows:—"A bath of alum (consisting of one part of pulverised alum to sixty parts of common water), to be used immediately after the toning bath, and letting the sheets soak five to ten minutes. Afterwards one proceeds in the accustomed way to fixing. In using this remedy, care should be taken that the acidity of the alum should be corrected before the immersion of the prints in the hypo bath. It is possible that the alkaline condition of the prints upon emerging from the toning bath may be sufficient to neutralize entirely the acid reaction of the alum. This can easily be tested."

ECONOMIST.—Much depends on the number of negative films. Silver may undoubtedly be recovered, but whether remuneratively or not, we cannot say. It has been done in America. At a recent meeting of the Philadelphia Society Mr. Clemons said that in working over some silver residues a short time since he had extracted 2 ounces, 2 drachms, and 24 grains of metallic silver from 1000 old negatives 8½ by 6½. Plates that had been treated with sulphide of potassium did not yield as much silver as those simply finished without strengthening.

AN AMATEUR.—Something depends on circumstances; but, as a rule, a negative does not require more than one-fourth or one-third more exposure than a collodion positive.

AMATEUR.—Your gum-gallic plates developing on the merely placing in water to soak, prior to legitimate development, is not a very unusual thing with very fully exposed dry plates of that kind. Yours had doubtless received a full measure of exposure, and gallic acid, being a developing agent, brought out the image as soon as the water made it into solution.

H. F. R.—The stippling of the flesh is very neatly done; but the colour is a little too bright and raw. The backgrounds are a little too rough.

NORMAN MAY.—Thanks. The papers are very interesting and useful.

WELLESLEY TURNER.—Your revised list of prices for carbon enlargements received. Thanks.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR JUNE.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	29.18	29.20	29.27	60°	61°	63°	Heavy showers a.m. and p.m. Very strong wind
2	29.32	29.37	29.46	54	58	53	Rain this evening. Gloomy all day
3	29.50	29.48	29.45	56	63	55	Fair, generally sunny
4	29.50	29.52	29.48	59	63	66	Rain this evening
5	29.40	29.58	29.75	66	59	55	Rain, with strong wind, at night
6	29.70	29.56	29.53	55.5	58	50	Rain up to six p.m.
7	29.56	29.69	29.00	54	58	52	Fair and sunny
8	29.91	29.82	29.70	58	56.5	55	Rain afternoon and night
9	29.76	29.80	29.80	58.5	—	55	Fair, generally sunny
10	29.80	29.80	29.86	58	59.5	56	Rain this morning. Generally gloomy
11	—	29.96	29.90	58	65	54.5	Fair and sunny
12	29.82	—	29.87	58	68	57	Fair, generally sunny
13	—	29.90	29.95	62	65	59	Fair, very sunny
14	—	30.00	30.02	59	66	58	Fair and sunny
15	30.03	30.08	30.06	62	68	60	Fair and sunny. Very clear
16	30.08	30.05	30.02	61	71.5	61.5	Fair and sunny. Very clear
17	30.00	—	30.00	66	75	65.5	Fair and sunny
18	29.99	29.99	29.98	72	78	70	Fair and sunny
19	30.01	30.01	29.99	71	76	69	Fair, generally cloudy
20	29.93	29.95	28.80	73	77	65	Fair, generally cloudy
21	29.82	29.97	29.61	70	78.5	68.5	Fair, generally cloudy
22	29.41	29.57	29.55	67	63	55	Rain a.m. and p.m. Rather windy at night
23	29.50	—	29.76	60	—	51	Fair and sunny
24	—	29.98	29.97	56	59.5	54	Fair and sunny
25	29.97	29.90	29.88	58	63	58	Rain this morning and evening
26	29.75	29.80	29.88	58	—	66	Rain this morning
27	29.97	30.02	30.02	58.5	61	67	Rain this evening
28	30.05	30.05	30.04	61	58	58	Rain at night. Sunny during the day
29	29.97	29.95	29.91	59	59	58	Rain all day
30	30.05	30.08	29.98	58	63	58	Fair, generally sunny

Summary.				Mornings. Noons. Nights.		
Highest temperature	74°	77°
Lowest ditto	51	56.5
Mean ditto	60.6	65.2

Mean of all observations ... 61°.4

Days on which rain fell...	...	...	...	13
Fair days ...	...	...	...	17
Fair days sunny...	...	...	...	14
Fair days gloomy...	...	...	...	3

During the warm weather, from the 16th to the 21st, the temperature at three o'clock in the afternoon was several days up to 84°.

The Photographic News, August 17, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. A MAGAZINE ILLUSTRATED BY PHOTOGRAPHY—ON POSING IN PORTRAITURE.

A Magazine Illustrated by Photography.—Photography has made one more step in advance in the matter of book-illustration. For the first time one of our magazines appears with a photographic illustration, and there cannot be a doubt but that it will be the forerunner of many such pictures. Such circumstance brings us still nearer the goal we are approaching, when photographs will compete with woodcuts and engravings in our literature. The particular case we refer to is the *Dublin University Magazine*, the distinguishing feature of which is a portrait of Tom Taylor, the editor of *Punch* and well-known playwright. The portrait is one taken by Messrs. Window and Grove, and is produced by the Woodbury photo-relief process. Strange to say, this is the only process, seemingly, which is being worked by photo-mechanical printers, and Lichtdruck or Collotype printing would seem for the moment to be in abeyance. It is difficult to understand why this should be. That there are unlimited demands for mechanical printing now-a-days is tolerably obvious, and the number of Woodbury pictures struck off in London, Paris, and elsewhere must be exceedingly great at the present moment. But one sees no Collotype impressions about. They can be produced very successfully, as everybody knows who has witnessed the proofs that have come to us from Germany from time to time, while in our own YEAR-BOOK we have shown that the art is practised with no little success in this country. Collotype prints have many advantages to recommend them, not the least being that they are produced by a fatty ink, and are as permanent as ordinary print and paper; they require no mounting, and lie as flat and even as any printed matter with which they may be bound together. We have Collotype prints in our possession, both portraits and landscapes, received four or five years ago, which would satisfy the most fastidious of publishers, and yet to-day we seem just as far off as ever of putting forward a well-illustrated book with pictures by the Collotype method. The reason, we fear, is to be found in the fact that the Collotype process cannot always be worked with that degree of perfection and certainty so necessary in commercial matters. Good prints are produced every day, so good that, as we have said, any publisher would be glad to accept them; but we have not, apparently, arrived at a sure and uniform mode of proceeding, which can only be secured when the production of the negative, of the block, and of the print, are sufficiently under the control of one skilled and experienced in the particular conditions to be fulfilled. In printing, a most delicate operation in Collotype work, not only is a skilled printer required, but he must be an experienced Collotype printer. And where is he to be obtained? There is no school of instruction open to him, and consequently time must elapse for men who are, perhaps, skilled in the kindred art of lithographic printing to become experienced in pulling prints, not from a hard, unyielding surface, but from a comparatively soft and spongy one. We say that we must wait until lithographic printers learn Collotype work; and yet we are not so sure whether they would, after all, be the most likely people to employ, since they would have much to learn and more to unlearn, and a man already thoroughly versed in one art is usually not very ready to learn another. He is conservative, and likely to stick to his old ways, which have hitherto given him good results. And the printing difficulty is, as we have said, only one to be got over. The production of a block, soft and delicate, with all the half tones of the cliché, and yet possessing vigour in the blacks, is not so easily done as many think who read the details of the Lichtdruck process which have appeared in these columns and elsewhere; for while at times success may crown one's efforts, this is not always to be obtained at will. There is,

in a word, much still to be done in Collotype printing before it can be said to be outside the domain of experiment.

On Posing in Portraiture.—The time, fortunately, has gone by when the photographer was worried by the visits of "friends" to his studio, who accompanied the model, as they modestly explained, in order to pose him or her. In the early days of photography such occurrences were very frequent, and sitters would come accompanied by a brother or sister, uncle or aunt, who had an uncommonly fine taste in all art matters, and who had, therefore, consented, for the nonce, so far to sacrifice dignity as to enter the studio of a photographer, and show the latter how to pose properly. We should like to hear what Mr. H. P. Robinson, of Tunbridge Wells, or Mr. Valentine Blanchard, would say now-a-days to any such individual who desired to teach them something of their art. We once met a painter in the lobby of a dining room, who innocently thought to ingratiate himself with some noted photographer present, by remarking to us, *sotto voce*: "Ah! I thought that was Mr. Camera; I used to know him some time ago, and helped him a good deal with his work. I don't mean, of course, the photographic part of it, for I don't profess to know anything of that, but the art aspect of the matter. He liked me to come and pose his sitters for him." Luckily, the Mr. Camera was at some little distance, and did not hear the remark, otherwise I fear an explosion of some force would have followed. But the idea certainly is, with many painters and draughtsmen, still, that the photographer is incapable of posing well, and that this part of the duty is done quite haphazard, the result being good if the sitter himself has posed with a *savoir faire*, and the reverse if such is not the case. The photographer, in any case, has nothing to do with the result. But it by no means follows—and this, people are very apt to forget, whether they are artists or not—that, when you assume an easy attitude, the same looks easy and graceful. There never were, for instance, more born gentlemen on our stage than at the present moment, most of them possessed with the idea that they can fulfil the rôle of *jeune premier*. And yet these very men do not seem to behave as gentlemen on the stage. It is one thing to be easy and unconstrained, and another thing to appear so without offending good taste. This only comes with experience, and no young man, however well he comports himself in a drawing-room, could hope to place before an audience such an artistic picture as, for instance, Mr. Charles Matthews's finished acting represents. In the same way, sitting down easily in a low chair before the camera does not, perforce, produce an easy pose. An experienced photographer, however, knows what will, and he sometimes makes his sitters assume what they imagine must be a very stiff attitude, in order to produce the wished-for effect. And, singularly enough, painters seem quite as liable to err in this simple matter as other people. The other day we were looking over a collection of cabinet pictures taken for the most part with considerable taste and skill by a gentleman amateur. A lady at work before a sewing-machine was admirably contrived, the machine and work being carefully subdued, so as not to obtrude and take away from the portrait itself; another more difficult subject still, a cricketer, all in white, was also capitally rendered; but a third portrait was, on the other hand, terribly marred by the centre of the picture being taken up by two square slabs of considerable dimensions, the one representing the sketching book, and the other the palette of an artist, whose face occupied the left hand top corner of the photograph. He was posed, paint brush in hand, in a low chair in a most painful and constrained attitude, apparently, in which it would have been impossible for him to move, except by spasmodic action. And this pose was not that of the photographer, but of the painter himself, who, no doubt, would have resented any interference on the part of an amateur. "Here I am: I am a painter, do you see. You observe my palette, and brush, and picture, and this is how I do them." Thus spoke the picture as plainly as could be.

CLEANING AND RESTORATION OF OIL PAINTINGS.*

Cleaning Oil Paintings.—It is oftentimes the case that both frames and oil paintings are left with the gilder to renovate, and it is highly important that he should be informed as to the best methods in use for cleaning, remounting, varnishing, &c., and also to know some of the best receipts used in the various processes. It may be as well to caution the inexperienced not to attempt too much, as an error in judgment, or careless manipulation, may entirely ruin a valuable picture; and those who wish to undertake the restoration of oil paintings must, in the first place, be careful, and then try some of the most simple processes, before trying those which would even tax the skill of the experienced. The cleaning and restoration of paintings is usually paid for most liberally, and to the man of business this chapter will be worth gold and silver, while the amateur who wishes to try his hand on one of his own pictures will be delighted with his success, if he possess the skill and judgment to follow the instructions laid down. Oil paintings come to hand for restoration in almost every state of decay; and where a valuable work of art has been neglected, with the canvas rotten, or worm-eaten, or where the body of paint has parted from the canvas, or where the picture is cracked badly, and pieces of the picture fall away, it requires thought, judgment, and a careful and skilful man to treat these works of art so that succeeding generations may be delighted with their beauty.

Cleaning oil paintings is a most important operation, and one that requires great judgment as well as skill—judgment to decide what treatment is really required for the state of the picture, and skill to successfully carry out the necessary work. The condition in which pictures are found is so various, and produced by so many different causes, added to which, the various grounds on which colours of various chemical proportions are placed, justifies our opening remarks. A few cautions may be acceptable, as no positive rules can be laid down for the successful treatment of every subject. Care should be used not to saturate the face or back of the picture with water, as the absorbent nature of many of the old pictures would completely ruin them. Damp will make canvas rotten, and it is difficult oftentimes to get the damp out of a painting when once it has been saturated. A soft sponge with the water squeezed out of it, or a soft leather well wrung out, should be the extent of water application, and the picture never flooded. If damp is applied to the back of an old canvas, it is likely the picture will blister, or come up from the base. Before commencing it is almost needless to say the dust and dirt on the surface should be removed carefully by sponging.

In cleaning paintings, our efforts must be directed to the removal of three things:—Stains or discolouration, dirt, and varnish. A remedy for the first is ox-gall, applied with a soft brush till the stains disappear, and sponged clean.

The removal of varnish oftentimes occasions great trouble, especially when it is old and hard. If it is mastic, and has not been laid on many years, it can be removed by the friction of the finger; but a solvent must be employed to remove old hard varnish, and requires careful manipulation. The picture must be laid on a flat smooth surface, and having made up a wad of cotton wool, give it a dressing with the following mixture:—

Wood naphtha	...	...	...	3 ounces
Spirits of salts	...	...	...	1 ounce
Lined oil	...	...	...	½ pint

Commence with a circular motion of the hand; after a time, the picture, if very obscure, will gradually come out in all its details, but care must be taken that the rubbing is not carried too far, or the picture will suffer. Each time the mixture is applied to the rubber, it should be well shaken, and a new and clean place of the rubber chosen. The

lightest parts of a subject should be chosen to commence upon, so that it can be then seen how the work is progressing. The look of the painting and the colour of the rubber will tell the practised eye when to stop the action of the solvent, and it should be wiped over with spirits of turpentine. The above receipt will work much quicker where the varnish has not been laid on for any length of time. A stronger solvent for varnish may be required, and any of the following may be used, but only in practised hands, as they are known to be powerful agents in their work:—Spirits of wine, oil of tartar, pure alcohol, liquor ammonia fortis, soda ether, naphtha, and oil of spike lavender. In using any of the above, the operator should know what antidote to apply in case their action is too rapid. Copal is the hardest varnish and will require some of the more powerful.

It is scarcely necessary to mention here, that where a picture has not been varnished, no solvent must be applied to remove any dirt, &c., but a leather wrung out with water and a little of the finest whitening, to produce a little friction, will most likely clean the surface.

The removal of varnish by friction is a common method and is done by rubbing the face of the painting with the first and second fingers of the right hand, previously dipped in powdered resin. The varnish, if it is mastic, will soon give way, and come off in fine powder. The surface of the painting must be wiped frequently to see how the work proceeds or it may be very much damaged.

If pictures have received damage, and present an uneven surface, and require the restoration of colour, all indentations on which it is desired to apply colour should be stopped up with either the stopping or the compo used by gilders. The first is parchment size and whitening, mixed into a thick paste, and the second is glue and whitening, the receipts for which can be seen in another part of this volume. Either of these must be carefully laid on with a small palette knife or modeller, and well smoothed down. The surface of the picture should then be cleaned over with turpentine.

The restoration of colour in old pictures is difficult, and, in many, the colours never can be restored to their original beauty. Where pictures have been hung in dark corners, and have scarcely seen daylight, they would be greatly benefited by being placed in a strong light for a length of time. We have recently found this to be very beneficial to a pair of portraits looking very much as if the artist had painted a post mortem representation, which came out in the course of nine or ten weeks in blooming health. The effect of a strong light on paintings, in the restoration of colour, is sometimes wonderful.

Where a picture has been restored, before varnishing, it would be advisable to put on a layer of weak isinglass, which is transparent, and would be a slight interposing medium. This will prevent the new paint cracking, if varnished before it is sufficiently hard.

Picture Restoration.—In the course of the correspondence on the genuineness and condition of some of the paintings in the National Gallery, Mr. J. C. Robinson has furnished the following particulars of the theory and practice of picture restoration:—

"The thick, solid painting of 'oil-pictures' is generally executed with colours in which the oil greatly predominates, but the more delicate and transparent tints and minor details are executed with varnished colours tempered with a minimum quantity of oil.

"Now, the oil vehicle is the hardest, toughest, and most durable; the varnish medium, on the other hand, is much more tender and evanescent. Moreover, the transparent tints executed with it are very thinly applied, most frequently on the surface of the picture, as more transparent washes, technically called 'glazing.' In the pictures of some schools and particular masters the place which these 'glazings,' &c., occupy in the general pictorial scheme or 'technique' is all important. For instance, in the works of the Venetian masters, commencing with Titian, of whom many of the Dutch seventeenth century painters, &

Claude Lorraine, and, above all, of our own Sir Joshua Reynolds, the entire lustre, depth, and vivacity of colour—all the most fascinating qualities, in fact—are due to the infinitely various and skilful manner in which the final or superficial paintings, 'glazing,' and 'tonings,' are executed in these rich, transparent varnish colours.

"But from the beginning to the end of the 'building up,' if I may so express it, of every oil-picture, portions of the work are alternately executed in the harder oil vehicles and in the tender and more perishable transparent varnish colours. These pictures are never homogeneous in their composition—that is, they can never oppose exactly the same amount of resistance to deteriorating agencies in all portions of their surface or substance.

"Pictures are, unfortunately, habitually subject to be cleaned—i.e., washed over for various purposes with fluid solvents, such as turpentine and spirits of wine. The latter fluid, if applied in sufficient quantity and strength, and for a long enough period, to the surface of the picture, would entirely dissolve it, and remove every vestige of the paint from the canvas or panel; but this particular solvent acts irregularly and unequally—very slowly upon the portion of a picture painted with the solid oleaginous vehicle, but rapidly on the transparent resinous tints; in other words, the alcohol rapidly dissolves the gum resins of which the varnish colours are mainly composed, while, at the same time, it leaves the oil vehicle comparatively untouched.

"The effect, then, of passing a wash or spirits of wine over the naked surface of delicate, transparently-painted pictures—such, for instance, as those of Claude Lorraine—may be easily imagined; it is to reduce them immediately to things of threads and patches; portions, for instance, will be entirely effaced, others half obliterated, while others will be scarcely, if at all, injured; but the final result, it is scarcely necessary to say, will be absolute, irretrievable deterioration.

"In order to protect the delicate and easily-injured surfaces of oil pictures, and for other legitimate reasons, they are always, sooner or later, covered over with superadded varnish, often thickly piled up, from time to time, one over another, during long periods. These coats of old varnish, however, are liable, sooner or later, to become dirty and opaque, and so more or less to conceal the painting beneath; and then it becomes requisite to remove them, either entirely or partially. If nothing but the right kind of varnish has been used the process is a perfectly simple and safe one; but if improper kinds of varnish and other 'nostrums' have been at different times applied, the operation may become very complicated and difficult. The practical skill and, above all, the long acquired experience of a conscientious and painstaking picture cleaner is then imperatively required. The matter may then be not inaptly compared to the surgical treatment of a human being. The really accomplished picture cleaner acquires, as it were, much the same kind of intuitive insight into the state of a picture as an eminent surgeon does into that of the patient upon whom he is to operate; and just as the learned practitioner saves his patient and restores him to health, while the ignorant, blundering quack may kill him with a single touch, so a picture may be rescued from the inevitable deteriorating influences of time and accident, and restored, as it were, to fresh life, or blotted out for ever by presumptuous and unskilful hands in the twinkling of an eye.

"There is only one kind of varnish proper to be applied to oil pictures—pure mastic dissolved in turpentine; for, in addition to other superior qualities, this varnish may at any time be removed in a peculiarly safe and convenient manner. For centuries this varnish has been known and universally employed as the pre-eminently fit and proper one. Unfortunately, it was reserved for this country of ours, at the period of its densest ignorance in matters artistic, to give rise to a race of reckless and stupid quacks, by whom a fatal admixture—worse than poison—was brought into almost universal use, and made to supersede the only true and proper vehicle before alluded to. Towards the end of the last century, more especially, it became the frequent prac-

tice with English picture cleaners and restorers to mix oil with the varnishes with which they covered ancient and modern pictures alike. Two overwhelming evil results ensue from the use of oil varnish. In process of time it gradually darkens and loses its transparency. According to the dose and kind of oil mixed with the varnish, and the thickness of the superadded coats, it gradually passes through every tint, from pale yellow down to deep chestnut, brown or black, while, at the same time, every year that it remains it becomes harder, tougher, more concrete, and difficult to remove. This varnish, when much oil enters into its composition, is, in fact, identical in composition with the vehicle used in the painting of the picture, and when applied directly on the uncovered surface of the work, and allowed to remain for many years, it becomes, as it were, part and parcel of the painted surface itself, and cannot be removed by any known means without injury to it. In some rare cases it is quite hopeless to attempt to remove the varnish, and the picture so covered must be left to languish from year to year, and finally perish in a sort of Stygian fog.

"Now, perhaps, the worst offender in this serious matter was the first keeper of our own National Gallery, the late Mr. Segraver, an eminent picture dealer of forty or fifty years ago. This disastrous person invented an oil varnish of his own, which he called, *par excellence*, 'the Gallery varnish.' The oil which he mingled with the varnish was of the worst possible kind, and the dose seems to have been of the largest. It was boiled linseed, or 'drying oil'—a kind of oil which actually undergoes slow spontaneous combustion, and in process of time becomes absolutely carbonized and black. With this diabolical mixture he literally covered over and over again nearly all the great masterpieces in the National Gallery, and probably also hundreds of other admirable pictures in the country houses and galleries of the gentry and nobility throughout England. For twenty years more the fatal effects of this varnish have been recognized by all really well-informed lovers of art, and successive keepers and directors of the National Gallery have made attempts to remove it from the pictures which had suffered the most from its effects. Now the removal of this varnish from every picture to which it has been applied is quite imperative, and every year—nay, every day—which is lost, increases the risk and difficulty of the operation, inasmuch as the blackening and hardening are ever in progress.

SOME REMARKS ABOUT PHOTOGRAPHING INTERIORS, AND ABOUT PORCELAIN BATHS.

BY RICHARD DOUGLASS.

A few weeks ago I was called upon to make some views of interiors, whose light was so dim that my plates were covered with stains from long standing. I was about to give the job up hopelessly, when presently a bright idea occurred to me. I asked if they had any glycerine in the house. A small bottle of it was procured, and a few drops were put into my collodion and silver. The subsequent plates were free from stains, although left in the camera for from thirty to forty minutes. Curiously enough, the high lights, such as windows, bright objects reflected from mirrors, were distinctly visible on the plates just as they came out of the plate-holder. The developer brought out the rest without fogging, save a slight veiling on the windows. This phenomena I never saw explained. Can anyone explain it?

Mr. Casey Lee, in his excellent work on photography, says about porcelain baths: "If there is the slightest flaw in the glazing inside, the solution will penetrate it and gradually saturate the whole of the porous biscuit which makes the body of the vessel, between the inside and outside glazing. This not only involves a great loss of expensive silver solution, but after a time the outside glazing also probably cracks, and some day the operator finds his bath empty."

Last year I carelessly broke my rubber view-bath, and used a porcelain one in its stead, having before heard that silver would penetrate porcelain, but I thought my bath an exception. I trusted it with my solution over night, and even left it in for weeks. I suffered no inconvenience from it for about nine months, but lately, when taking a view, I noticed some diminution of solution. I suspected nothing, so refilled it, and work went on. An hour after work was done I returned to it and found it empty. This justifies what Lea says in his manual. Let those who use porcelain silver baths be careful to select perfect ones, or dispense with them entirely.

CRYOLITE OPALINE GLASS.

CRYOLITE was discovered toward the end of the last century in a bay in Arksut Fiord, West Greenland, where it constitutes a large bed or vein in the gneiss of about three hundred feet in length and eighty feet in thickness. The name is derived from two Greek words meaning "ice" and "stone," and is applied because of the fusibility of the mineral in the flame of a candle. It was supposed to be sulphate of barytes until examined by Abildgaard, who found it to contain fluoric acid. Subsequently Klaproth detected soda in its composition. It was not, however, until 1850, when Jules Thomson discovered that the mineral could be easily decomposed either by the dry or wet way with lime and the calcareous salts, that it came into industrial use. In appearance, cryolite is snow white, partially transparent, of vitreous lustre, and brittle texture. Its hardness is 2.5, specific gravity 3; and it cleaves in three directions, two of which are rectangular.

From cryolite, aluminum, alum, caustic soda, and glass of a peculiar quality are obtained. About six thousand tons of the mineral are yearly brought to this country for soda manufacture. The glass is produced in Philadelphia under the name of "hot cast porcelain," and, when made of pure cryolite, is milky white in hue, and slightly transparent. Impure cryolite yields an opaque glass, closely resembling marble. The mixture for milky glass consists of—

Oxide of zinc	...	...	1 part
Cryolite	...	...	4 parts
Sand	...	...	10 "

This is melted in pipe-clay pots, which are not attacked by the fluo-silicic acid disengaged. The glass is very hard, remarkably solid, and is not attacked by strong acids, even when pulverized. These properties are doubtless due to the presence of undecomposed cryolite. With a small quantity of the mineral, the glass is brilliant, and refracts light strongly; with a greater quantity it becomes opalescent; and, finally, on more cryolite being added, the glass turns opaque, and closely resembles porcelain.—*Scientific American.*

ALKALINE DEVELOPMENT.

BY M. ERNEST BOVIN.*

Nor only is the presence of nitrates of silver unnecessary in alkaline development, but it seems actually to be injurious to the process. Alkaline development is more generally employed for dry plates than in the wet process, and is especially suitable for emulsion and bromide collodion. Chemists appear to be divided in opinion upon the theory of this manner of development, but there are, nevertheless, certain points which are generally conceded.

Thus it has been completely proved that the alkaline salts exercise an oxidizing action, ammonia acts upon the bromide with which it is mixed, transforms it into oxybromide, and eliminates a portion of the bromine. This simple body combines with a portion of a base, and forms compounds of a very stable character and very difficult to oxidize. It unites with iodine and iodides, and forms a compound which corresponds to bi-bromide, and remains fixed and unoxidizable. This prevents the formation of fog, which would

infallibly result from the contact of iodide of silver with the alkaline salt, a contact which would transform the entire film into oxy-iodide of silver, absolutely identical with that produced by the chemical action of luminous rays, and would consequently blacken throughout, under the influence of the reducing agent. This effect is to be obtained in the case of a very prolonged exposure when bromo-iodized collodion is employed; bromine, which has less affinity for oxygen than iodine, separates from the oxy-bromide, spreads over the plate, and communicates to it a greyish tint, which is generally known under the name of solarisation.

The alkaline salt exercises its oxidising action upon the oxy-iodide of silver produced by the chemical action of the light, and transforms it into pure oxide; the iodine displaced permits the reducing agent to decompose the oxide by absorbing its oxygen, and leaving a deposit of metallic silver, an action which continues until the total reduction of the oxy-iodide resulting from the chemical action of the luminous rays has taken place.

Alkaline development is much more energetic and much more active and powerful than acid development; its employment in dry processes renders it precious, and permits one to reduce in a material degree the duration of the exposure.

The bromide in alkaline development is a moderator of incontrollable utility; it plays exactly the same rôle that acetic acid performs in the ordinary development of wet plates; bromide should be employed in greater quantity in warm weather and when the exposure has been long, and in small quantity when it is cold and the exposure has been short. It is the bromide which clears up a picture and prevents any accidental fogging.

In alkaline development I have replaced with very great advantage pure ammonia, carbonate of ammonia, the saccharates of lime and potash, with glucoside of ammonium; I employ the latter in precisely the same manner as ammonia, that is to say, in doses of drops only in the developer. I obtain with this glucoside of ammonium much more intensity, vigour, and regularity in development than is the case when the former substances are employed. The glucoside may also be used in addition to ammonia to impart increased vigour to the cliché when the details have appeared, and I may say that the results thus secured are really remarkable. It is always advisable to employ a few drops of bromide at the same time as the glucoside, that which I prefer being the bromide of ammonium.

I prefer the glucoside in the manner following:—In 100 cubic centimetres of liquid ammonia I dissolve 10 grammes of grape sugar (glucose); I allow the solution to remain for some days, filter, and add 100 cubic centimetres of water. I filter once more, and preserve it in a stoppered bottle. The glucoside does not seem to deteriorate on keeping.

ON THE IMMEDIATE AND POSSIBLE EFFECTS OF CERTAIN RECENTLY PROPOSED ADDITIONS TO THE NEGATIVE BATH.

BY W. HOWARD.*

THE last paper was devoted to considering the effects of an agent which came within the literal range of the wording adopted in the title affixed to the series. In the present article regard is given to other agents, which, though not falling so entirely within the literal boundaries of the title, are at least germane to the general subject, inasmuch as by decompositions naturally taking place in the negative bath in the course of time, or more directly induced by additions to the collodion, they sooner or later affect the negatives produced from it. These agents are the nitrite and acetate of silver, both of which salts are formed in the bath by the reactions set in motion by ordinary use. The nitrite is the first stage in the reduction of the nitrate by the alcohol and ether introduced by every plate immersed. The acetate results from the acetic acid produced by the full oxidation of part of the alcohol and ether,

* *Mentour de la Photographie.*

* Continued from page 385.

which then combines with any silver present in the metallic state or in the transition state of oxide.

It has recently been ascertained that some of our collodion manufacturers add nitrites (probably of the alkalies) to the article they produce, with a view of increasing its sensitiveness. Some of our transatlantic friends are of opinion that a similar result is achieved by using a collodion containing acetic acid. Amongst many English photographers there prevailed a few years ago a practice of adding acetate of soda to the negative bath, with a like object in view. Of late, this agent has fallen into disuse, and has, if I am not much mistaken, been condemned as injurious by many able workers.

The trials which I have made with the two salts were conducted in connection with an alkaline carbonate bath, prepared in the manner previously described. These experiments were divided into two classes—*i. e.*, those in which the accelerating agent used was added to the collodion in the form of an alkaline nitrite or acetate, and those in which the nitrite or acetate of silver, carefully prepared, was added directly to the bath. The addition of nitrite of potash to the collodion, in the proportion of about two grains per ounce, produced very marked results. The time required for exposure was very considerably shortened, and the image developed with great rapidity; but, as a serious drawback, the rapidity of exposure gained was accompanied by dense fog. Repeated trials gave a similar result—very short exposures, but always accompanied by fog. This was just what I had anticipated, for in my experience of the matter I have noted that even neutral baths, in which, as I was positively aware, nitrite of silver happened to be present, invariably produced foggy plates. This result is doubtless due to the readiness with which the silver nitrite is reduced by light in the presence of organic matter, this property enabling it to act upon the other compounds present by assisting readily in the molecular or chemical disturbance set up by exposure, and rendering the entire surface of the plate more or less liable to receive a metallic deposit upon development. The addition of silver nitrite to the bath, in quantities not exceeding one grain per ounce, gave results which agreed in every respect with the above statements.

One other result, not at all desirable, was brought into notice after a very few plates capable of introducing nitrite into the bath had been immersed—this was the production of pinholes. This effect was also produced in the bath to which the silver nitrite had been previously added. A slight distinction may be made between the two modes of working, *viz.*, the addition of an alkaline nitrite to the collodion, and its subsequent and consequent decomposition into silver nitrite; and an alkaline nitrate upon immersion in the bath produced pinholes in the plates in a shorter time than did the direct addition of silver nitrite to the bath. This fact of the ready production of pinholes by collodion containing nitrites has, I think, been noticed by other workers, although they have not, so far as I am aware, made mention of any peculiar liability to fog following upon its use. My own impression is, that when working with an ordinary bath, which is pretty safe to be in an acid condition, there is no formation of nitrite of silver; and this opinion is based upon these grounds: the free acid usually present in the bath is nitric acid, and that this acid simply decomposes like the nitrite in the collodion, producing an inert nitrate, and liberating nitrous acid, which is again in turn decomposed by the large quantity of water present, forming a small quantity of nitric acid and some nitric oxide. Taking this view of the matter, it will appear that any increased sensitiveness which follows upon the use of a collodion containing nitrites in conjunction with an ordinarily acid bath is due to the decrease in the quantity of free nitric acid (restrainer) present. In an alkaline or neutral bath the nitrite of silver can readily form when such a collodion is used, and it asserts its presence by greatly increased rapidity of exposure, and great liability to fog. The pinhole aspect of the

result remains to be considered. We have in the case of an ordinary bath increased liability to this annoyance, and in the case of an alkaline carbonate bath which, under ordinary circumstances (*i. e.*, the use of a collodion free from nitrites), appears to be free from this defect, its not very remote occurrence. In the first case this may be traced—even assuming that no silver nitrite is produced—to the circumstance that the inert, but fairly soluble, nitrates usually produced are introduced with greater rapidity, and consequently the less soluble iodo-nitrate is precipitated at an earlier period.

In the case of the alkaline carbonate bath my observations had led me not to the conclusion that iodo-nitrate did not form in it, but only to consider that the presence of the free alkaline body retarded its precipitation. When, however, upon the positive introduction of more than the usual quantity of soluble nitrates, and also some nitrite of silver, a body more soluble, indeed, than the iodo-nitrate, but, as compared with salts generally, very slightly soluble, I was not at all surprised at the result, the above considerations appearing ample explanation of its appearance on the plate.

Now, bearing in mind the fact that an alkaline bath readily undergoes reduction by the agency of the alcohol and ether imparted to it, and that silver nitrite must at times make its appearance, I should not be much astonished if those who make a trial of it should now and then be troubled with fog and pinholes. The remedy for such a condition I have already pointed out: add nitric acid, and a fresh quantity of carbonate of silver afterwards.

The use of acetate of silver in conjunction with this bath gave very favourable results, not much difference being observable in the results obtained by using a collodion containing an alkaline acetate, or by using a bath containing acetate of silver. This last was added to the bath in the proportion of about three grains per ounce. The result was a reduction of exposures to about half the time required by a faintly acid bath, and very considerable when compared with an alkaline one. No fog produced, and tendency to form pinholes avoided, even on continued working. The accelerated exposures are attributable, no doubt, as in instance of the nitrite, to the influence exercised by the acetate of silver in more readily determining decomposition in the camera. The freedom from fog observed arises very probably from the greater stability of this salt, in consequence of which the reduction effected by the developer is not so violent and instantaneous in character. The oxide of silver is more readily reduced than the nitrite, and the nitrite more readily than the acetate; hence new baths made with over-fused nitrate containing oxide and nitrite of silver invariably produce fog, while very old baths, in which these bodies have been converted into acetate, nearly always work with rapidity and cleanliness of result.

I think that while no immediate difference is made by using acetates in the collodion, the preferable plan is to introduce the acetate of silver directly into the bath. This may be done by adding acetate of soda; but seeing that this will falsify the argometer reading in an unusual degree, and also that it is thus quite possible to introduce sulphate of silver, as commercial acetates are generally contaminated with sulphates, it is advisable to prepare the acetate of silver by decomposing a strong and hot solution of silver nitrate with soda acetate, also in a strong solution, filtering, and permitting to crystallize. The crystals may be washed with distilled, or silvered and sunned water, and allowed to dry spontaneously in the dark room, being carefully protected from dust. They can then be weighed and added accurately to the bath, thus avoiding the introduction of sulphates, or unnecessary inert nitrates, either of which might induce the pinhole nuisance.

In conclusion, I may remark that the much talked of procedure adopted by M. Boiminas is very probably chiefly dependent on the addition of acetates to a neutral bath, or an alkaline one like Mr. Eliot's.

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AN IMPORTANT IMPROVEMENT IN EMULSIONS.

EMULSION photography has progressed much more slowly than, having regard to its simple and scientific character, might have been anticipated. The simplicity and attractiveness of using a single preparation for coating plates containing all the sensitive salts within itself, instead of obtaining these salts by immersing a coated plate in a solution where the sensitive layer is formed by double decomposition between the silver salt in the bath and the haloid salt in film, would, one might easily imagine at the outset, have given emulsion practice an unquestionable claim to preference. A variety of minor drawbacks have, however, served effectually to check the progress of emulsion in general favour and application. One of the primary troubles arose from the fact that the sensitive salts were formed in the emulsion by double decomposition, and hence it contained other salts besides the sensitive salts of silver, and these other salts were not only useless, but injurious, crystallizing on the film, and becoming a fruitful source of pinholes. We remember well when, something like seventeen years ago, we conceived the brilliant idea of producing an emulsion containing the sensitive salts, we added nitrate of silver in about its equivalent proportion to bromo-iodized collodion. With this we coated a plate, exposed it when set, soaked it a few minutes in water to prepare it for the developer flowing freely, and then developed first in plain pyro, and then with acid pyro and silver. We obtained a very respectable image, but it was covered with pinholes. As, besides this drawback, no especial advantage had been gained, we reluctantly gave up, for the time, emulsion work, after a few more experiments. We simply recal this brief essay to remark that similar difficulties beset emulsion work even after Messrs. Sayce and Bolton had given the bromide emulsion a practical form.

Many very capable photographers have, in the meantime, devoted themselves to improving the emulsion processes, which have now attained a high state of excellence. In collodion emulsions an efficient, but certainly somewhat troublesome, method of washing serves to eliminate the nitrates formed by double decomposition in the emulsion. In gelatine emulsions a similar plan has been adopted from the first. Two methods have been adopted in gelatine emulsions to remove the nitrates. The first, which is very efficient and scientific, is that by dialysis: a process which readily permits of the separation of crystalloid bodies from colloid bodies. But this process is slow and troublesome, and more essentially suited to the practice of the amateur than to that of the manufacturer working on a large scale. The other method is that patented by Mr. Kennett, in

which the emulsion, when formed, is poured in a thin layer in a dish, and when set is cut up into strips. These strips are then washed in cold water, which is supposed to wash out of them all the soluble salts, consisting of the nitrates, leaving intact the insoluble bromide of silver entangled in the gelatine. In practice, this method appears to answer very well, judging from the excellent work we have seen produced on Mr. Kennett's plates, and with his pellicle. Without disparaging this method, however, we venture to think that a new method, recently brought under our attention by Messrs. Wratten and Wainwright, is an improvement on all prior methods. Their method simply consists in washing the sensitive gelatine emulsion with alcohol. This, it will be seen, has no soluble action on the gelatine, nor, at first sight, it would seem, should it have on the nitrate of ammonia or other base which is to be removed. But another very important principle comes into operation, in virtue of which the nitrates are effectually removed. Alcohol is very greedy of water, and will absorb it whenever it is brought into contact with it, even though it be in the possession of such a hygroscopic body as gelatine. On placing the gelatine emulsion in contact with alcohol, it is rapidly robbed of its water, and with the water go the soluble salts which were in solution in the water. A gelatine pellicle is thus rapidly obtained without water and without the nitrates which had been dissolved in the water. The principle is scientific and elegant, and the practical issue is most perfect, as we can testify. Mr. Wratten, of the firm of Wratten and Wainwright, to whom this discovery is due, has shown us results, and enabled us to test the mode of procedure, which appears to be in every respect satisfactory.

As the use of gelatine emulsion is by no means common or familiar amongst photographers generally, a resume of the principles and practice as employed by Mr. Wratten will here be found useful; and in presenting it to our readers, we may remark, as giving it the authority of a practised and successful hand, that the method of procedure is due to that gentleman. In the preparation of a gelatine emulsion—the simplest and least complex of all forms of emulsion, and the easiest to compound—the elements usually employed are gelatine, bromide of ammonium, potassium, or any other base, and nitrate of silver. The requisite quantity of bromide of any base that may be chosen is first dissolved in a portion of the water, the gelatine added, and left to soak for a certain time. The whole is then placed in a receptacle containing water of (say) 100° temperature, and solution of the gelatine is quickly brought about. We have now a solution of bromised gelatine which bears a strict analogy to bromised collodion. To form the emulsion from this compound it is now necessary to dissolve the proper quantity of nitrate of silver in the remainder of the water, raise it to the same temperature as the bromised gelatine, and then stir it gradually and carefully into the latter. When the mixture is made, insert the stopper and shake vigorously for a minute or two, to bring the two elements out of which the sensitive salt is to be formed into contact with each other. Hereupon double decomposition is set up, and in order that this may be the more perfectly completed the emulsion is kept at a temperature of from 90° to 100° for three or four hours. This being properly completed, the emulsion contains two elements, the one bromide of silver, the true sensitive material, the other an encumbrance worse than useless, in fact—to use Palmerston's definition of matter in the wrong place—dirt. This must be eliminated, or it will crystallize upon the film, and ruin it. There have been, hitherto, two recognized methods of effecting this operation, the one, as we have already explained, that of dialysis, for which we are indebted to Mr. Josiah King, of the Bombay Civil Service; the other, as we have explained, consists in pouring of emulsion into a flat dish, allowing it to set, and washing it with a large quantity of water, for which we are indebted to Mr. Kennett. But it may be said of both

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To all interested in dry plate work, and especially in emulsion work, we think the improvement we have described will prove most valuable as aiding them to secure simplicity and certainty in producing plates of the greatest sensitiveness, giving results of very high quality. As the film of gelatine is singularly free from grain, reticulation, or texture, the negatives are admirably well adapted for enlargement.

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Vol XXI. No. 989.—AUGUST 17, 1877.

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AN IMPORTANT IMPROVEMENT IN EMULSIONS.

EMULSION photography has progressed much more slowly than, having regard to its simple and scientific character, might have been anticipated. The simplicity and attractiveness of using a single preparation for coating plates containing all the sensitive salts within itself, instead of obtaining these salts by immersing a coated plate in a solution where the sensitive layer is formed by double decomposition between the silver salt in the bath and the haloid salt in film, would, one might easily imagine at the outset, have given emulsion practice an unquestionable claim to preference. A variety of minor drawbacks have, however, served effectually to check the progress of emulsion in general favour and application. One of the primary troubles arose from the fact that the sensitive salts were formed in the emulsion by double decomposition, and hence it contained other salts besides the sensitive salts of silver, and these other salts were not only useless, but injurious, crystallizing on the film, and becoming a fruitful source of pinholes. We remember well when, something like seventeen years ago, we conceived the brilliant idea of producing an emulsion containing the sensitive salts, we added nitrate of silver in about its equivalent proportion to bromo-iodized collodion. With this we coated a plate, exposed it when set, soaked it a few minutes in water to prepare it for the developer flowing freely, and then developed first in plain pyro, and then with acid pyro and silver. We obtained a very respectable image, but it was covered with pinholes. As, besides this drawback, no especial advantage had been gained, we reluctantly gave up, for the time, emulsion work, after a few more experiments. We simply recal this brief essay to remark that similar difficulties beset emulsion work even after Messrs. Sayce and Bolton had given the bromide emulsion a practical form.

Many very capable photographers have, in the meantime, devoted themselves to improving the emulsion processes, which have now attained a high state of excellence. In collodion emulsions an efficient, but certainly somewhat troublesome, method of washing serves to eliminate the nitrates formed by double decomposition in the emulsion. In gelatine emulsions a similar plan has been adopted from the first. Two methods have been adopted in gelatine emulsions to remove the nitrates. The first, which is very efficient and scientific, is that by dialysis: a process which readily permits of the separation of crystalloid bodies from colloid bodies. But this process is slow and troublesome, and more essentially suited to the practice of the amateur than to that of the manufacturer working on a large scale. The other method is that patented by Mr. Kennett, in

which the emulsion, when formed, is poured in a thin layer in a dish, and when set is cut up into strips. These strips are then washed in cold water, which is supposed to wash out of them all the soluble salts, consisting of the nitrates, leaving intact the insoluble bromide of silver entangled in the gelatine. In practice, this method appears to answer very well, judging from the excellent work we have seen produced on Mr. Kennett's plates, and with his pellicle. Without disparaging this method, however, we venture to think that a new method, recently brought under our attention by Messrs. Wratten and Wainwright, is an improvement on all prior methods. Their method simply consists in washing the sensitive gelatine emulsion with alcohol. This, it will be seen, has no soluble action on the gelatine, nor, at first sight, it would seem, should it have on the nitrate of ammonia or other base which is to be removed. But another very important principle comes into operation, in virtue of which the nitrates are effectually removed. Alcohol is very greedy of water, and will absorb it whenever it is brought into contact with it, even though it be in the possession of such a hygroscopic body as gelatine. On placing the gelatine emulsion in contact with alcohol, it is rapidly robbed of its water, and with the water go the soluble salts which were in solution in the water. A gelatine pellicle is thus rapidly obtained without water and without the nitrates which had been dissolved in the water. The principle is scientific and elegant, and the practical issue is most perfect, as we can testify. Mr. Wratten, of the firm of Wratten and Wainwright, to whom this discovery is due, has shown us results, and enabled us to test the mode of procedure, which appears to be in every respect satisfactory.

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FRENCH CORRESPONDENCE.

M. FLAMENT'S MODE OF DEVELOPMENT—HIS MANNER OF PREPARING AND USING DEVELOPING SOLUTIONS—BOIVIN ON ALKALINE DEVELOPMENT—SUBSTITUTION OF GLUCOSIDE OF AMMONIUM FOR CARBONATE—A NEW COMPOSITION FOR MOULDING COMPOSED OF GELATINE AND PLASTER—ACTION OF LIGHT ON HYDRO-IODIC ACID—PHOTOGRAPHIC ARRANGEMENTS IN THE FRENCH MUSEUMS.

To any one who pays attention to photographic manipulation, it is evident that the smallest details have a relatively considerable influence upon the success of the operation. The same formula employed in two cases will not give identical results if, for instance, the work is carried on at different temperatures, or the mode of manipulation is varied in a slight degree. A photographer to whom we owe already many interesting practical details, M. Flament, has lately called my attention to a mode of preparing the iron developer which gives him, in the practice of portraiture, results of a very remarkable character. And yet M. Flament has in no way altered the formula which he ordinarily makes use of; he has only observed, as many others before him, that his solution became reddened a short time after its preparation, and that it also became charged with acid on exposure to air, thus losing much of its reducing action. This fact being proved, M. Flament conceived the idea that it would be advantageous not to add the acetic acid and alcohol except at the moment of employing the developer. The experience of several months has proved that he has done well in carrying out this idea. Here is the manner in which he operates:—He keeps in stock a saturated solution of protosulphate of iron; this salt is soluble, when cold, in double its weight of water. At the moment of developing he takes twenty cubic centimetres of this solution, and adds to it—

Rain water...	...	...	60 cub. cents.
Acetic acid	...	...	10 "
Alcohol at 40°	...	...	5 "

The developer is now ready for use, but before it is poured upon the plate M. Flament adds some drops of a solution of five per cent. strength of acetate of soda, which gives more delicacy and detail to the image, without, however, accelerating the development.

I have at this moment in my hands a very exhaustive communication from M. Boivin on alkaline development. The ingenious experimentalist has pointed out in this note the role which bromide plays as a moderator. As to the pure ammonia, carbonate of ammonia, lime and potash compounds, my friend advantageously replaced them by a substance which he calls by the name of glucoside of ammonium, and which he prepares in the manner following: In 100 cubic centimetres of liquid ammonia are dissolved 10 grammes of glucose (grape sugar); this solution is allowed to remain for some days, and it is then filtered, after which are added 100 cubic centimetres of water. Another filtration of the liquid then takes place, and the liquid is then preserved in a well stoppered bottle. In this way the solution may be kept without undergoing decomposition. The glucoside of ammonium is employed in precisely the same manner in alkaline development as ammonia; that is to say, a few drops of it are poured into the developer at the moment of flooding the plate with the latter. In this way much more intensity, vigour, and uniformity in the development of the image result than is the case with the substances above mentioned.

It is possible also to employ the glucoside of ammonium as an intensifier, with ammonia as the reducing agent; in this case it is applied as soon as the details have appeared. It is well to add, under these circumstances, a few drops of bromide solution, the bromide of ammonium being that preferred by M. Boivin.

I have just seen at the residence of M. Guilleminot some novelties which seem to me of a most successful nature, since they well fulfil the purpose for which they have been

designed. They were accessories for the portrait photographer, and represented artistic furniture, roots of trees, rocks, balustrades, &c., all manufactured with a composition of gelatine and plaster backed with wood. This mixture, which is admirably suited for moulding, takes all the forms which it is desired to give it, even when fine work, or carving upon a piece of furniture, is to be represented. It hardens to a very high degree, and yet it is not heavier than cardboard. It may be coloured and varnished without difficulty, so that it is perfectly suited for anything like theatrical decoration. Finally, it is very inexpensive, so that accessories of this description are very cheaply produced. It is a capital discovery that M. Guilleminot has made, in my opinion, and I believe most photographers will be of the same way of thinking.

In an important memoir on the action of light upon hydro-iodic acid presented last week to the Academy of Sciences, by M. Lemoine, there is this curious fact alluded to. If a certain quantity of this acid is exposed to light for a month in the form of gas, it is found that eighty hundredths of it are decomposed; whereas if the same were subjected to heat during the same time, even to a temperature of 265° Centigrade, only two-hundredths of the gas are decomposed. The action of the light is *nil*, on the contrary, upon a concentrated or dilute solution of the acid in water. The influence of oxygen contained in the air is felt but very slowly.

There is much activity just now in organizing in all the Museums, under the direction of the Minister of Instruction and the National Library, photographic arrangements for the reproduction of objects therein contained by means of the camera. Your readers are already acquainted with the nature of the arrangements that have been made by the French Government for the reproduction by any one, who fulfils the conditions laid down, of the art and science treasures of the State. I need scarcely say that this privilege has been received on all sides with marks of universal satisfaction.

ERNEST LACAN.

ON THE DEPTH OF PRINTS AND INTENSITY OF NEGATIVES.

BY CAPTAIN ABNEY, R.E., F.R.S.*

THE part of the subject which deals with the intensity of negatives is more difficult than that which deals with the depth of prints, as so much depends on the colour of the deposit in the former, and the absorptive qualities of sensitive salt of silver. It may be laid down, however, that the errors in gradation of the former counterbalance, in a great measure, the errors in gradation of the latter, as the errors lie rather in opposite directions. In using the revolving wheel, as in the other experiments, there is a slight danger of error, owing to the scattering of rays by the particles, and their subsequent reflection from the back of the plate; and if this apparatus be employed it is safer to employ a wheel which, instead of giving a gradual increase of exposure from the centre, gives a step by step increase of exposure. Thus, supposing the radius of the wheel to be eleven inches, it is better that the whole of the first inch should give no exposure, the whole of the second inch an exposure of one, of the third inch of two, and so on. By this means, if the density of the middle of each inch of exposure be measured, the error caused by irradiation is practically eliminated. That this is no needless precaution can be proved by the fact that at the outer rim of the wheel, where the spokes are connected together, a sensible deposit will be found on development, whilst nearer the centre, where the exposure commences, the plate will appear perfectly transparent. By calculation, the effect due to the irradiation may be deducted, but the method indicated answers the purpose better.

Again, in settling the part which the density of a nega-

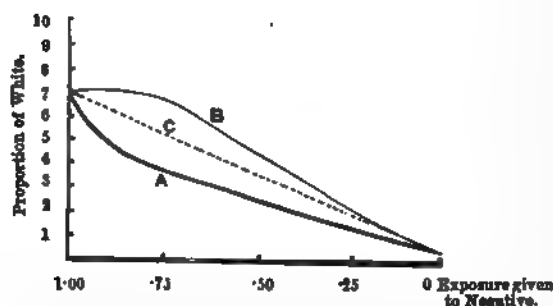
tive plays in protecting sensitive paper, it is almost essential that a modified method should be adopted in order to estimate the results correctly. Suppose we have a large surface uniformly exposed to light, developed, and fixed, and cut such a plate into portions, and place one portion above another, it would be manifestly incorrect to say, without experiment, that the light passing through two of these superimposed portions bore a definitely fixed proportion to that passing through one. In the first place it would be necessary to examine the spectrum of light passing through one, two, three, &c., thicknesses, and to prove that the actinic radiations were uniformly absorbed; and supposing that this was proved to be the case, it would be further necessary to estimate the amount absorbed by each layer.

With an ordinary wet plate negative of a black tint the absorption of light by each layer may be taken to be uniformly carried on through the whole of the spectrum; but in negatives produced by certain dry plate processes (the bath and also the emulsion processes) this is not the case, and, therefore, the modifications indicated in the measurement of such negatives are essential. It is well known that with certain processes a very thin negative is capable of giving a very brilliant print, whilst the same gradation of opacity in an ordinary wet plate negative would give a print decidedly inferior, and wanting in depth if the high lights have to be preserved pure in tone. In estimating the value of the opacity of a negative for experimental purposes it is necessary to estimate the amount of grain in the deposit. Looking at a wet plate under the microscope it will be found that opacity is given by perfectly black particles of metallic silver, which absolutely cut off a portion of the light, whilst the portion which penetrates filters, as it were, through the interstices. On the other hand, in a thin negative which yields a good print, the silver is apparently continuous, and is in an excessively thin layer. In this case it appears that the grain is much finer, and the interstices smaller, than with an ordinary wet plate; and that the light, which is transmitted through the metallic silver itself, together with that filtering round it, is less than it would be were the particles opaque, or arranged in coarser manner.

Again, it must not be forgotten that in some processes, the salts of silver are reduced to the metallic state in the thickness of the film itself, and not simply deposited on the surface, as in the case of wet plates—more particularly when using horny collodions.

The accompanying figure shows in a marked manner the

Fig. 13.



difference in gradation that is to be observed in two negatives produced by different processes. The curves are from prints taken on a three per cent. paper, printed from negatives exposed under the rotating wheel, and, as before stated, a certain allowance must be made for irradiation, though in the corrected curves the general effect would not be greatly different. A is the curve obtained from a wet plate negative, and B that obtained from an albumen beer plate negative, developed solely by the alkaline method. The colour of the former deposit is of the well-known grey-black, and of the latter of an olive-green tint.

From these there is instruction to be got. It will be

seen that the wet plate negative gives too rapid a gradation in those parts where the dry plate gives too slow a gradation. By combining a wet plate development with the alkaline development, the gradation should prove more nearly correct; the curve given by such a method lying more nearly in the line indicated by C. This is nearly obtained by employing the alkaline developer to bring out a faint image, and then intensifying with pyrogallie acid and silver. Some operators have found an increased delicacy in a negative so treated, and this may account for the fact. Be this as it may, it seems that there is evidently much to be considered in the way that a negative is treated. It should be noted that the wet plate negative was developed with a fifteen-grain ferrousulphate developer, and the dry plate with strong alkaline development, as given in my paper that appeared in the News in January last. It must be distinctly understood that the above diagram only gives types of a certain class of negatives, and that only for a portion of the intensities (though they are of such gradation as would yield vigorous prints when toned and fixed); and also that any alteration in the strength of developer and modes of development, &c., modify the resulting prints. On a future occasion it may be deemed desirable to treat of these.

PHOTOGRAPHY IN AMERICA.

BY NORMAN MAY.*

As compensation, in some measure, for the low salaries, the assistant finds the American photographer, as a rule, much more hospitable and kindly disposed towards him. He can make pretty sure that he won't be treated with a frown, and almost ordered off the place, if he should happen to call in search of a situation; but should no vacancy occur in that establishment, he will be recommended, with good wishes, to any friend or photographer whom they think likely to require any one. There seems to me a greater amount of sympathy and good-will, not only between employers and employed, but among employers themselves. An American will always be pleased to show a brother photographer, though a stranger, over his studio, and explain to him the working of anything that he may think useful. A great many English photographers would think the man very intrusive, and perhaps impudent, who would express a wish to look over their studios, and would be careful to keep out of sight any little dodges they thought helpful to make their pictures better than their neighbour's, and they go on in their own conservative fashion, rarely giving or taking a hint from any one. Can such men hope to excel? Some possess the finest instruments, get the best of chemicals, and use them with great intelligence; but still cannot and do not keep pace with the rapid advance of photography, but go on in the same old groove, till, on being shown some work of superior excellence, they see how immeasurably they have fallen behind. Even then their awaking is but of short duration, and after a little spurt or two they sink to their ordinary level. What reader cannot call to mind such a case as this?

The American exhibitions and associations are deservedly popular, and do an immense amount of good in educating and elevating the photographer, to say nothing of often taking the conceit out of him. A photographer who is "cock o' the walk" in his own immediate neighbourhood is flattered, and made to think he is a little king in the art, by his friends, and he is persuaded to send a frame or two to the exhibition, firmly believing that he is going to show them something extraordinary. He follows in a week or two himself, and sees how utterly insignificant his productions are compared with the pictures of others of whom, perhaps, he has not even heard. He goes home a wiser, if not a sadder man, finds out in which

* Continued from page 391.

direction he can improve, and by the next year he has made great progress; and though he knows there will be better photographs than his exhibited, yet he fondly hopes he will be able to stand the comparison better this time, and is amply rewarded by the encouraging remarks of his brothers in art. During the week of the Convention in connection with the National Photographic Association, photographers meet and discuss the latest improvements. Old ideas will come up with new faces, photographs are exchanged, useful acquaintances made, lectures given illustrated with the lantern or dissolving view apparatus, and, altogether, the photographer feels he has not made the journey of often one thousand or more miles in vain.

Their exhibitions and meetings are almost invariably a great success. Somehow, they seem to infuse more life and spirit into them than the English generally do, and more real and permanent good seems to be done. Each individual member thinks he must do what he can for the general good, and they go into it with right good will, determined to succeed, and, therefore, rarely failing. I attribute the success of the Americans, in a great measure, to their good feeling towards each other, their willingness to explain and show what they find of benefit to themselves, their exchange of ideas, and study and criticism of each other's works; in short, the absence of that conservatism that exists to a vast extent among English photographers.

Though the Americans are a most hospitable and genial people, they do not neglect a chance to make the almighty dollar, and advertising finds much favour with them, sometimes in the most original and ingenious way. In the suburbs of a town—or, indeed, in the town, if there is a vacancy—the side-walks and fences, especially, are covered with phrases extolling the beauties of "So-and-So's" articles. I have seen many curious advertisements on the board fences, but never expecting to write of them, and seeing so many of all businesses, I did not take any notice of them; but "So-and-So is lightning on children, and 'old folks, too!" would rather astonish and amuse English people. "So-and-So is a whale on Rembrandts!" would also sound at least peculiar; yet such are genuine advertisements. "Cleanliness is next to Godliness. Buy Morgan's soap!" was painted on the stables adjoining a church. Very suitable and appropriate, perhaps, but rather different to what we are used to, and what we should consider the thing. Still the Americans are quite a different people to the English, and have different ways of doing things. Their own way is much more conducive to their success, seeing the people and materials they have to deal with, than the English one would be.

The Editor of the *Practical Photographer* was quite right when, alluding to the criticism of the English writer in one of the photographic journals a few weeks since, he said that the American's expressions were "not understood" in England, and, therefore, often condemned, as people often laugh and sneer at what they do not understand. An Englishman finds himself in just the same circumstances when he goes to America; and till he gets used to and understands the people, it's hopeless for him to think of succeeding in any commercial enterprise. That editor knows the people he is writing for, and cannot be taught by an Englishman how he ought to address them.

Respecting the good feeling among photographers, I once called on a photographer in Clinton, Iowa, an utter stranger to me, who, without any letters of introduction, invited me to stay at his house for a fortnight or so, and would hardly take a refusal. I dined with him once or twice, and shall not soon forget his kindness. I have heard from him since, and he sent me photos. of himself, wife, and daughter, which for retouching and general excellence are not at all behind the work of some of our leading men, and that from a little town of five thousand or so of inhabitants, possessing four or five other photographers. Of course, every one won't invite a stranger to stay a few weeks, but such an incident as I have men-

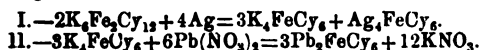
tioned would hardly be possible in England. Among no class of men have I seen a greater amount of good feeling than the photographers of America, a trait which the English might copy with advantage, instead of being afraid every one that calls on them is going to learn their secrets, and use them to their disadvantage. How long will it take people to understand that it is not the apparatus or formula that makes the picture?

(To be continued.)

THE LEAD INTENSIFYING PROCESS.

BY DR. V. WARTHA, OF PESTH.*

DR. EDER has asserted that the action of nitrate of lead and ferri-cyanide of potassium upon silver forms ferrocyanide of silver and ferrocyanide of lead, and further states that the reaction proceeds as under:—



I believe that, supported by my former experiments, I shall be able to prove that these decomposition equations are not exactly correct. At the same time I desire to make a few general remarks upon the subject of the lead intensifying process.

Although it is a very generally-known fact, still it is worth while to call attention to the circumstance, that the lead intensifying process can only be undertaken in the dark, the progress of the action being watched from time to time by the aid of diffused light†. If this precaution is not taken, then, in consequence of the separation of ferrocyanide of lead by the reduction of the ferri-cyanide of potassium, a white precipitate is formed, which very often gives rise to fogging of the negative. Everyone who has worked with a lead intensifier may not have remarked this white precipitate, but instead, a yellow one; in the same way it will be found that the action of very fine silver leaf upon a solution of ferri-cyanide of lead is followed, not by a white precipitate, but by an orange-coloured one. If, further, the lead intensified plate is covered with water which contains but a minute quantity of hyposulphite of soda, then a yellow turbidity is produced, and the plate becomes white. The orange-coloured precipitate which appears in solutions of ferri-cyanide of lead is only reduced by the addition of an excess of silver leaf; and, in like manner, the orange plate is completely discoloured when put into water containing fine zinc particles in suspension. We have here to do with a reduction process, and the ferri-cyanide of silver which has been formed is reduced.

The colour of the precipitate, and its reducing property through zinc and hyposulphite of soda, point to its containing ferri-cyanide of silver, and I believe that the under-mentioned equations properly express the matter:—



Or, in other words, there is formed a ferri-cyanide compound, and not one of ferrocyanide.

If silver acts alone upon ferri-cyanide of potassium, only white ferrocyanide of silver is formed, and, so far, is the observation of Dr. Eder perfectly right; if, however, nitrate of lead comes into the question, then the matter is different, and the solution behaves as if it were a solution of ferri-cyanide of lead.

Finally, I may remark that I have not been able to succeed in intensifying dry plates by the lead process. Most curiously, the precipitate which is formed permits itself to be washed off like loose sand, and this, I think, may be explained by the fact that, in dry plates, the silver image lies upon the surface of the collodion film, which, in the case of wet films, is in the body of the collodion itself.

* *Photographische Correspondenz*.
† Dr. Vogel contradicts this assertion.

Correspondence.

YELLOW GLASS FOR SPECTACLES.

DEAR SIR,—Seeing an article in the News of August 10th concerning yellow light, and a suggestion as to the use of yellow glass for spectacles, I beg to inform you that I have found it to be a fact that yellow glass gives greater rest to the eyes than either blue or green glass. I have ascertained this fact for the last three or four years, having been in the habit of holding a piece of yellow glass between my eyes and my book when reading; I also found that I could see objects at a distance much plainer with it than without it. Acting on this I made myself a pair of spectacles by chipping a couple of pieces till near the size of an old pair of rims which I had by me, then I rubbed them on a stone until they fitted properly. I found they were very useful, but they ought to have been made of a larger size. To prove their efficacy I took them with me one day when visiting my brother, who is a member of the Merthyr Volunteer Force, and he proposed we should go to the targets, as it was practice day, and try their use. The drill sergeant, who was present, and several volunteers who were there, all said it was the best thing for the eyes they had ever tried, as it took off all the glare of the light without impeding vision, and allowed them to see the targets most distinctly.

If you think this worth publishing, it is at your service for the purpose.—Yours truly,
J. L. BUNAY.
1, Market Street, Aberdare, South Wales, August 14th.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

One of the ordinary out-door meetings of this Society was held on Thursday, the 9th inst., the locality selected on this occasion being Aberdour, one of the most picturesque places on the banks of the Forth. The village itself—a favourite watering place with a quaint old harbour—is flanked both on the east and west with such beautiful combinations of rocks, wood, and water, as to have long made it a favourite resort of artists, both of the brush and the camera.

The boat, the *Lord Aberdour*, was timed to start at 9.30, by which time the members were on board in the exuberant spirits usual on such occasions when the appearance of the day promises to be favourable to good work, but they were doomed shortly to be damped, in more senses than one. Although the atmosphere was bright and clear when they started, before they had got out of the harbour they were enveloped in one of the dense fogs that occasionally comes on, making it impossible to see from one end of the vessel to the other, and condensing in minute globules, like hoar frost, on the dresses and beards of the passengers. Under such circumstances progress was, of course, slow, and the almost incessant sounding of the fog whistle, answered occasionally by the faint twinkle of the bells of the vessels in the offing, had a peculiarly weird effect, not at all unpleasant, but certainly not pleasant enough to make up for the disappointment likely to be caused by the failure of photographic operations. Happily, however, it proved to be of but short duration, and when within sight of Aberdour it disappeared as suddenly as it came, revealing a brilliant sun in an almost cloudless sky, and with an atmosphere so still that not a leaf was stirred.

The road from the landing pier winds round the face of the Hawk-craig, and at every turn offers some new and charming bits for the camera; but the party pushed on to the harbour, where, in consequence of the tide being sufficiently out, several vessels were grounded, and a number of exposures were made on most picturesque combinations. The Castle, Hawk-craig, and the woods to the east, offered some tempting pictures, but it was decided to reserve them for a future excursion, and work westward instead, and therefore the party passed through the village, and lunched in the pretty hotel immediately opposite the gate and entrance to the Donibristle grounds. After luncheon an ordinary meeting was constituted, with Dr. JOHN NICOL in the chair, and some routine business transacted, including the admission of Messrs W. Bertram and James Robertson as ordinary members.

The drive through the Donibristle grounds is enchantingly beautiful. Wooded almost to the water's edge, the cathedral-aisle-like avenues offer here and there most lovely peeps of Inchcolm, Cramond, and other islands which stud the Forth, and give a variety of which the visitor never tires. The first halt was made at Dalgety Church, a fine old ruin, built in the fourteenth century, and in which lie the remains of many of the Seton family. It stands in a beautiful bay, close to the water's edge, and although requiring very wide-angle lenses, affords several fine pictures. Here the cameras were set up, and as long exposures were required they were left to look after themselves while some of their owners enjoyed a refreshing swim in the Forth, and others, under the leadership of Mr. Sinclair, extemporised a choir, and gave full vent to such music as the surroundings always inspire. From Dalgety the drive was continued to Donibristle House. Donibristle, like most houses of its time, has seen many ups and downs. It was at one period the residence of the abbots of Inchcolm, and has been three times destroyed by fire, the last time only some dozen years ago. It consists of a centre and two wings, the latter at a considerable distance from the former, and connected with it by under-ground passages. The centre is a mere shell of crumbling walls, but the wings are still inhabitable.

The only thing of interest here—at least, of interest to the photographer—is a fine example of forged work, in the shape of a gate presented by Queen Anne of Denmark. This was photographed from various points, and after enjoying the "soft recumbency of outstretched limbs" on the velvety lawn which dips into the water, the drive was continued across the grounds, and out by the north gate.

Fordel Castle, with its exquisitely beautiful garden, was the next object of attention. Under the guidance of Mr. Foulis, who has been for nearly fifty years at once head gardener, factor, and general factotum to the Hendersons of Fordel, the party were first conducted through the extensive garden and "houses," and then through the beautiful glen that leads to the castle, an ancient baronial relic of former times. It is in excellent preservation, and contains many curiosities, including some large pieces of tapestry from the old home of Pitreavie. The glory of the place, however, is the ornamental garden, which it would be difficult adequately to describe, and on which the highest possible degree of gardening skill, guided by the purest taste, has been expended.

The remaining plates were exposed here, and the rest of the time spent in examining the castle, and listening to the lore connected therewith, so humorously retailed by our guide, until they were obliged to leave in order to catch the last boat, which they did after a hurried tea in the hotel, and arrived safely in Edinburgh about nine o'clock. We may add that all the plates used were the collodio-bromide emulsion, and that the exposures varied from five to forty minutes.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of the Amateur Photographic Association was held July 31st, T. SORWICK, Esq., M.A., F.R.S., &c., in the chair.

The minutes of the last meeting having been read and confirmed, H. B. Broadhurst, Esq., and the Rev. W. E. Hancock, were elected members.

The SECRETARY called the attention of the meeting to the fact that a large number of old prize negatives, which are the property of the council, were now rarely used for printing purposes; and suggested that it might be well to present them to their previous owners.

After a long discussion, it was proposed by Mr. Glaisher, and decided by the meeting, that, as the question was one of considerable importance, it should be postponed for further consideration at the next meeting of council. A. J. MELHUIS, Hon. Sec.

Talk in the Studio.

BOUCH'S NEW CATALOGUE.—The catalogue just issued by Messrs W. W. Bouch and Co. ought to be in the possession of every photographer. It is not simply a very complete list of apparatus, chemicals, and other photographic material, but, in many respects, a valuable handy reference-book containing much information and many hints in practice. The illustrated descriptions of much of the apparatus will also be found valuable and interesting.

PRETENDING TO TAKE PHOTOGRAPHS.—A novel crime in connection with photography is mentioned in a Worcestershire

paper William Stewart, described as a travelling photographer, is said to have been sentenced to twenty-one days' imprisonment for fraudulently obtaining moneys from school children, whose photographs he pretended to take with a blacking box. A similar fraud was perpetrated, a correspondent states, some years ago, when a travelling photographer "hard up" used a plate box with a flange screwed on, as his pretended camera.

To Correspondents.

B. C. A.—Non-members, as well as members, are eligible as exhibitors at the forthcoming Exhibition of the Photographic Society; and are also eligible as competitors for the prizes offered. The conditions of membership in the Society are an interest in the art and the compliance with the rules of membership. To become a member you must be duly proposed by a member. The nomination having been submitted to the Council and passed, the nominee is then submitted to the ballot in a meeting of the members, and elected. The subscription is one guinea annually, and one guinea entrance fee. We regret that extreme pressure of duty did not permit us to write. We shall have pleasure in proposing you as a member of the Society if you desire it. The next session commences in November next.

A. CONTINENTAL SCHNITZER.—It is not an easy task to criticize a series of views, and say how far they conform to the canons of pictorial composition, nor is it a pleasant task to point out individual shortcomings, but it should be candidly done if we are to be of service. There is in the pictures forwarded a general tendency to under-exposure, which is very injurious to landscape photography, as it tends not only to produce harsh contrasts of black and white without detail, but also to destroy all atmospheric effect. In No. 1 the wall in front of the cottage is a mass of black with-out detail, quite antagonistic to pictorial effect. No. 2 is better as regards exposure, but there has been a diffused light fatal to detail, and to light and shade, especially in the building at the right hand of the picture. There is, moreover, in the foreground a mass of road without any object of interest to break its unpicturesque monotony. No. 3 has more pictorial quality, and has a slight tendency to over-exposure. No. 4 is under-exposed; the foreground is an unrelieved black mass. No. 5 is better but there is no detail in the masses of black-looking foliage. In No. 6 the point of view is faulty. The spreading mass of water which forms the foreground, with a narrow strip of landscape high up in the picture, form a very unsatisfactory picture. No. 7 is under-exposed, and has not detail in the uninteresting foreground, nor in the foliage. Nos. 8 and 9 are spoiled artistically by the unpicturesque character of the foreground lines of railway are rarely picturesque, and especially if constituting the most prominent elements of the picture. If suitable cloud negatives had been printed in the sky, the pictorial effect would, in many cases, have been somewhat redeemed, but a black sky is fatal to even very good landscapes. The omission to which you refer in the *Jahrbuch* is curious, but will probably be rectified next year.

R. O. L.—The defect known as "crapshoot," of which you complain, is due to the presence of too much water in your collodion, or, in other words, to the use of ether and alcohol insufficiently rectified. It is probable that excess of somewhat weak alcohol has been used. Equal parts of ether, of a sp. gr. of .720, and of methylated spirit, sp. gr. .820, will generally give a satisfactory collodion; but if, as you say, you have used two parts of rectified spirits and one part of ether, the collodion will probably contain too much water. The collodion once made, you cannot remove the water, but you may use up the collodion by mixing it with another good sample. You may also, to some extent, modify the defect by letting the film set well before immersion in the nitrate bath.

F. L. D.—For use on opal glass, collodio-chloride of silver should always have citric acid added. In printing with this preparation on opal glass we prefer to work on the glass itself without any substratum. Take dilute albumen, consisting of one part of white of egg to three or four parts of water, and apply an edging about one-eighth of an inch wide all round the glass; when that is dry, coat with collodio-chloride. Allow the film to set thoroughly. Then dry by a dull fire, and print as soon as the film is cold again. Tone in an old weak gold bath. Fix by immersion in a hypo bath, containing one part in eight, for five minutes; then wash under a tap for five or ten minutes. Plates so treated will be quite permanent. There are two causes for films splitting: one is the use of a very tough contractile collodion, the other the use of a collodio-chloride which has become somewhat decomposed with age.

R. H. P.—The method of preparing and using Lohmann's salt for producing red negatives has been more than once described in our pages. You would not be able to procure the salt ready prepared. It is a troublesome method of intensifying, and of doubtful value, as the deposit is not certainly permanent.

B. W.—The case is doubtless a deplorable one, and, we fear, only too common.

PERPLEXED.—You have thrown down all the silver in your bath as carbonate, which may be converted into nitrate by means of nitric acid. The idea that you must add the soda solution until there is no more effervescence is altogether an error, as there will be constant effervescence on adding it until all the silver is precipitated as a carbonate. The proper plan is very simple. Make a ten-grain solution of bicarbonate of soda, and keep it for use. Add of this a few drops at a time, shaking the bottle containing the silver solution, and then allowing it to stand a few minutes. Continue the addition until there is, after standing, a slight permanent turbidity, which will show that all the free acid has been neutralized, and a trace of the nitrate has been converted into carbonate of silver. Now place the solution in the sun for a few hours—or, if possible, a few days—then filter, and try a plate. It is probable that the bath will work clean and bright at once; if not, add a slight trace of dilute nitric acid.

S. J. B.—We fear that we have no means of helping you. The case is certainly very annoying and perplexing, but at the same time difficult to remedy. The plan you propose could not with safety be adopted. Your best plan will be to secure the aid of a solicitor; possibly a letter from a solicitor might be effectual.

J. L. HANLEY.—Send to our publisher a copy of each print, with full details of title of picture, name of photographer, name of proprietor of copy, &c., with 1s. 6d. for each picture, and he will get the registration effected for you.

RAWHAKAANA (N.Z.).—Your account of your trouble is too brief. Transparent spots are of many kinds, the most common being known as pinholes. Their causes are various, and have been much discussed of late in our pages. One of the most common causes is excess of iodide of silver in the bath. To remove this pour the silver solution into double its bulk of distilled water, and then filter and make up the proper strength by adding nitrate of silver. The addition of two or three grains of nitrate of baryta to each ounce of solution sometimes proves a remedy.

J. W.—Your bath, which has been used for paper, cannot with safety be used for collodion plates, but if you get unsensitized paper you can then use your bath. You had better now use the gold for the formulae for which you have prepared it. Let us know from time to time how you get on, and do not fear to state all your difficulties.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR JUNE.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Brighton, near Whitehaven, 26 feet above sea-level.

Date.	Barometrical Pressure.			Temperature in the Shade.			Remarks.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	29.80	29.85	29.83	62°	64°	60°	Fair and sunny
2	29.80	29.70	29.73	56	61	56	Fair, but gloomy
3	29.77	29.73	29.77	56	58	54.5	Heavy showers of rain, with hail, this morn and afternoon
4	29.80	29.70	29.60	58.5	61	57	Fair and sunny
5	29.80	29.70	29.71	57	61	55	Fair and sunny
6	29.84	29.70	29.63	53	59	51	Heavy showers, with distant thunder,
7	29.83	29.60	29.60	50.5	61	53	showers p.m. (this evening)
8	29.80	29.61	29.60	54	58	54	Fair, but gloomy
9	29.77	29.60	29.62	56	59	56	Rain nearly all day
10	29.74	29.43	29.43	52.5	54	50	Rain p.m.
11	29.80	29.67	—	51	52	54	Fair, generally cloudy
12	29.75	29.70	29.70	61	62	59	Fair, generally bright
13	29.75	29.60	29.60	61	62	59	Rain a.m. and p.m.
14	29.70	29.16	29.02	61.5	60	61.5	Rain a.m. and p.m.
15	29.70	29.60	29.60	63	60	58	Rain a.m. and p.m. Heavy clouds
16	29.60	29.67	29.16	57.5	60.5	56	Rain a.m. and p.m.
17	29.70	29.60	29.40	56	62	58	Rain a.m. and p.m. Very heavy
18	29.70	29.60	29.72	56	64	53	Fair and sunny
19	29.70	29.54	29.61	63	60	56.5	Rain this afternoon and evening
20	29.70	29.70	29.60	53	60	56	Fair, generally sunny
21	29.70	29.60	29.60	—	61	60	Rain a.m. and p.m. Thunder and light-
22	29.70	29.60	29.60	60	61	61	Rain a.m. and p.m. (ang at night)
23	29.70	29.60	29.60	62	64	59	Rain a.m. and p.m.
24	29.70	29.60	29.60	61.5	64	59.5	Rain this morning and evening
25	29.60	29.60	29.60	59	63	59	A few drops of rain a.m. and p.m.
26	29.70	29.70	29.60	64	64	60.5	A little rain p.m.
27	29.60	29.60	29.60	60	62	57	Fair, but gloomy
28	29.70	29.60	29.60	60	60	61	Small rain a.m. and p.m.
29	29.70	29.60	29.60	60	61	63.5	Fair, but cloudy
30	29.60	29.60	29.60	60.5	62	65	Fair, generally sunny
31	29.60	29.60	29.77	64	64	64	Rain this evening
Summary.							
Highest temperature observed				—	—	—	Mornings. Noons. Nights.
Lowest				ditto	—	—	— 63.5° — 68° — 61°
Mean				ditto	—	—	— 60.4 — 60.6 — 67.5
Mean of all observations							
Days on which rain fell				—	—	—	19
Fair days				—	—	—	12
Fair days bright				—	—	—	7
Fair days gloomy				—	—	—	8

The Photographic News, August 24, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

**CARBON PRINTING IS THE PAST—DESTRUCTIVE HAILSTORMS—
—ARE FUMES AND VAPOURS PREJUDICIAL TO PHOTOGRAPHIC WORK?**

Carbon Printing in the Past.—Carbon printing is still talked about with such an air of novelty at the present day that one is apt to lose sight of the fact that ten years ago it was being practised on an immense scale by one firm at least on the Continent. Probably the most extensive photographic establishment in the world, that of M. Braun of Dornach, employed pigmented tissue in the production of photographic prints immediately after the process was practically demonstrated by Swan of Newcastle, and we remember well, when we visited the vast institution in 1870, the work had already been going on on a large scale for a couple of years. It seems, therefore, a little singular to be still talking at the present day about the introduction of carbon printing into our studios in this country. No doubt in Braun's establishment there were many things which contributed to the success of carbon printing when it was once adopted. In the first place, the establishment of M. Braun is probably the largest and most complete photographic studio in the world, and thus help and assistance are always at hand whenever needed, no matter whether the same be required from the chemist, the practical photographer, the artist, or the manufacturer. When we mention that in 1870 there were no less than one hundred hands employed at the establishment, from the boys and girls employed on the printing and development of the images to the skilled artists engaged to retouch negative and positive, it will be seen that the resources of the establishment were well-nigh unlimited. The advice we have always given our readers who are engaged in carbon printing, to maintain everything connected with the work at a cool temperature, was a point which was never lost sight of at the Braun institution. A vast deal of cellar room existed at Dornach, and the operating and printing rooms opened out from these cellars, so that liquids and utensils are always preserved at a cool and uniform temperature. Well-nigh everything connected with photography was prepared on the premises; not only was the pigmented felsche tissue ground, and mixed, and spread upon paper in dry, sensitive condition ready for printing, but the chemicals—such as collodion, chloride of gold, nitrate of silver, &c.—were all made under the superintendence of the principal. No doubt this system contributed in no small degree to the success which characterized the Dornach factory. In those days no difficulty was made about printing pictures one metre and a quarter in length, and to show the extent to which carbon printing was actually resorted to it may be mentioned that from twenty-five to thirty bands of tissue, each measuring twelve feet in length, were daily consumed. We are not aware whether the production of photographs is carried on in the same extensive manner at the present day at Dornach, or by what modification of the process, if any, carbon prints are now secured. It was the Swan method which we saw in operation nearly seven years ago, but since then M. Braun, it is said, has established a house in Paris, and occupied himself with some of the novelties in carbon printing with which our readers are familiar. The Braun firm was wont to take all its own negatives, and made it a rule never to purchase. If pictures of the Nile were desired, or of Swiss glacier scenery, a competent photographer was at once despatched to obtain them, and as many as five gentlemen were constantly employed by M. Braun in travelling here and there in search of the picturesque. In this way the principal was enabled to control every negative, and no doubt this fact had something to do with the uniformity with which they could afterwards be printed. Indeed M. Braun would pride himself on remarking that he has conducted the whole

of the photographic operations from alpha to omega. Since that prosperous time of which we talk, Dornach has changed its nationality, and those who now reside in the Alsatian village are no longer French subjects. We do not know how far this matter has affected the prosperity of this flourishing establishment, but we remember that just before the close of the war M. Braun was called upon by the Prussian Government for a heavy money subsidy to make good the damage done to a German train which had been maliciously damaged by villagers who sympathized with the French. At the close of the war all were permitted to choose whether they would be French or German citizens in the future, and from the fact that a branch, at any rate, of the great Dornach firm has proceeded to Paris, we may infer that at any rate the Dornach establishment is not what it used to be. In any case, however, the name of Braun will always be connected with the early history of carbon printing, for he was the first undoubtedly, after Swan, to employ the process practically on an extensive scale.

Destructive Hailstorms.—Photographers in this country may congratulate themselves that they are not visited by the

destructive hail-storms which appear from time to time to sweep over Continental cities. From Berlin, a short time ago, news came of a most disastrous visitation of this sort, and our German cousins, we see, are earnestly taking up the question whether, under the circumstances it is not advisable to establish a Photographic Glass Insurance Company. As with us, there are at Berlin insurance companies where insurances may be effected against plate glass, but there are no establishments, seemingly, where ordinary glass may be insured. According to statistics which have been collected, no less than a score of photographers suffered loss by breakage by a late storm, the damage done in some instances being very great. One firm, it appears, had no less than 700 small panes broken, and another 225, testifying very vividly to the weight of the hailstones, and the terrible character of the tempest. Fifty, seventy, ninety, are the number of panes broken in many of the studios, representing a most serious and unexpected loss, some of the panes being very large and expensive. Toughened glass has been suggested for future use, but its expense, as also the lack of any information as to its being competent to resist sharp and sudden blows such as would be inflicted in a violent storm, naturally lead our brethren to avoid such an expensive substitute. The best way out of the difficulty would be, we should think, to establish a mutual assurance against such accidents, if such an institution could be formed among the photographers of the Vaterland.

Are Fumes and Vapour Prejudicial to Photographic Work?—Some discussion has recently taken place among the members of the Berlin Society for the Advancement of Photography in regard to the alleged destructive action of fumes in the dark room. A Swiss photographer, who had his studio next door to a goldsmith, complained that his plates were very apt to fog, and he attributed the defect to his neighbour's premises, although these were separated by a thick wall. Herr Quiddle, as also Dr. Vogel, were of opinion that too much importance was placed by photographers in general upon the injurious influences of fumes and vapours. Even strong ammonia vapour has no action upon the sensitive plate, at any rate if the silver bath gave an acid reaction. Dr. Quiddle stated that the only time he had noticed that the collodion film suffered was when his laboratory had been freshly white-washed, the odour of the lime acting prejudicially upon a sensitized film. No doubt these gentlemen are right in their dictum, but, for all that, we would advise photographers to keep their room as free as possible from fumes. The latter are, at any rate, not beneficial to the plates, if they do not act prejudicially, while it is very certain that vapours of one kind or another, if harmful to photographs, are not so to photographers. A well-ventilated dark room we hold

CLEANING THE DAGUERRETYPE.

BY W. L. SHONMAKER.*

It certainly is a matter of vain regret that one feels, on removing a Daguerreotype from its case, that a specimen that represents such a wonderful era in the graphic art should be subjected to ruthless handling by many professionals of the present. We have had pictures of every kind brought to us for copying, and I find the Daguerreotype the worst abused of all.

Although I have never followed the art of Daguerreotypy, still I appreciate and admire the wonderful results that often pass through my hands.

A photographer sent us a package consisting of a large number of Daguerreotypes and ambrotypes. These were taken from their cases, their mats, glass, and preservers removed, each wrapped in a little piece of tissue-paper, the whole enclosed in a paper box; when received the ambrotypes were broken to flinders, and I had to practise the mosaic art to repair damages; the Daguerreotypes scratched to destruction.

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To clean them and replace in the matt would have been easier than any other method, but I desired to make them a permanent thing if I could, and tried the following experiment: first removing, brushing off all loose particles, then immersing in a dish of hot water: this removed all gum from sticking paper on back, and softened the coating on surface quickly, so that on laying in a dish of weak cyanide, they cleaned nicely; after washing well, I poured over the surface raw albumen, gave a slight rinse under a small flow of water, then set up to dry spontaneously. After thorough drying each was placed in a dish of alcohol for a few minutes; this caused the albumen to be made insoluble, or, in other words, cooked it.

If the albumen is moist in the least degree when placed in the alcohol, the surface will dry opaque, and trouble will be given to remove; it but if the surface albumen is thoroughly dry it will remain transparent, and dry spontaneously.

This method I found left a good coating on the surface, and could be rubbed quite hard without marking.

I hesitated making this public at that time, as I desired to wait and see if they returned to their original condition; but on examining them a few weeks since I found them all good yet, no change having taken place. I felt doubtful myself at the time, for all who have cleaned Daguerreotypes, although they may have sealed them properly when putting them up, will know that a picture once cleaned is more liable to change than ever, if not very carefully washed.

RESTORATION OF PRINT BATHS.

BY A. STOCK.†

Now it has been customary to treat silver baths, whether they have been employed for the dipping of plates or sensitizing of paper, in precisely the same way when defective or out of order, notwithstanding the fact that the print bath becomes contaminated with quite a different series of organic compounds and impurities. This should not be, for the latter requires, as a matter of course, special treatment, although, strange to say, no manual gives any definite information on the subject. The ordinary impurities that enter the print bath are gelatine or size, superfluous acid, and combination of the latter with the chloride salts employed in the preparation of the paper. The precipitation of

the gelatine matter, as of the organic compounds, is brought about by the following means:

1. The silver bath is treated with alum solution 1:10 strength (ordinary alum dissolved in hot distilled water), until small crystals are seen to form, when the liquid is filtered. These crystals are silver albuminate, which are dissolved again in hot distilled water, and added to the silver bath again; a portion remains dissolved, while the rest again separates. This silver albuminate may be employed, therefore, again and again.

2. By adding and filtering off again burnt alum or hydrated clay, for, as is well known, the oxyhydrate of aluminium possesses a considerable tendency to combine with organic substances, and precipitate the same when in solution. As the hydrated clay exerts the same action against colour, it is far preferable to permanganate of potash when any discolouring of the bath takes place.

If the print bath is acidified pretty strongly with acetic acid, and the kaolin added until the smell of acetic acid has disappeared, and the whole filtered, then the sizing material is also completely coagulated by the acetate of aluminium which has been produced.

There remain still the different acids and their salts to neutralize and decompose. To do this, carbonate or bicarbonate of soda has hitherto been recommended to be employed. Now, although both those compounds, and especially the latter, are excellent agents for neutralizing the silver bath, I have never found the result to be a marked improvement in the bath.

On the other hand, we possess in caustic potash and soda two excellent means in neutralising and decomposing acids and salts present in the print bath. Both are dissolved in ten parts of distilled water. From one of the two solutions (the first is to be purchased of any chemist) enough is added to bring about a gelatinous precipitate, the liquid being from time to time vigorously shaken. The silver bath now assumes a transparent, milky turbidity, or, if it does not, more caustic potash is added, until the turbidity does not disappear, and litmus paper betrays a neutral reaction. This gelatinous precipitate cannot be filtered off, either by means of bibulous paper or cotton-wool, as all the pores are very soon plugged, and only moistened linen or flannel can be used for the purpose. The linen or flannel is strained tightly upon a square wood frame, and the liquid poured in the middle; the strainer must not touch at the bottom, but remain free. Neither must it be pressed, as in that case some of the gelatinous precipitate is forced through. It is well to let the filter process go on during the night, and then there is plenty of time for the liquid to run through bright and clear. Those who are not conversant with this method of filtering or straining should be initiated into it by a chemist. After the operation the cloth may be dried, and be employed again. In adding various substances to the print bath in order to purify it, one need not be nervous about going to work, for there is no harm in being a little out, and the print bath does not require such delicate handling as is the case with the negative bath.

Print baths treated in the manner described will be found to possess all the properties necessary to good working, and to impart to albumenized papers the finest lights and shadows. At the same time, the restoration of a print bath should not be delayed for any length of time, as sometimes happens with the negative bath, but should be treated periodically, especially so far as neutralization with caustic potash is concerned. If the bath becomes too alkaline, it may easily be rendered neutral again, after straining, by the careful addition, drop by drop, of pure nitric acid.

In the above lines I have desired to indicate the theory involved in the proper restoration of the print bath, and thus to acquaint my friends with the why and wherefore of the reactions.

Dr. Liesegang, in connection with the subject, points out the method employed by Mr. Maxwell Lyte to purify a turbid, brown print bath, a method which Dr. Liesegang

* Philadelphia Photographer.
† Photographisches Archiv.

to be one of the essentials towards clean manipulation, as it is certainly the only means whereby photography can be persistently practised without, in some way or other, being prejudicial to health.

GERMAN CORRESPONDENCE.

PHOTO-GRAYURE AND PHOTO-CHROMY—PERMANENCY OF CARBON PICTURES ON GLASS—INTENSITY OF ELECTRICAL LIGHT—CARBON PRINTING PROCESS IN SUMMER—WAR AND PHOTOGRAPHY—HOW MANY PHOTOGRAPHERS ARE IN THE WORLD?—QUANTITY OF CHEMICALS THEY CONSUME.

BY DR. VOGEL.

LAST year I sent you some information about Goupil's process of photo-gravure, which originally was invented by Woodbury. Recently there was brought into the market a series of printed leaves, prepared by this process, of which some have a size of twenty-two inches, and which, in general, meet with an acknowledgment among artists. In beauty they are equal to the old scriptum, and, indeed, they may be considered the most perfect invention so far in the line of photographic copper-plate printing. Goupil has also brought into the market coloured prints of this kind, the effect of which is considerably increased by their harmonious colours. About the other French process, photo-chromy, I must speak less favourably. The products of the same are sent to Germany in large quantities, and M. Vidal did not hesitate to produce in photo-chromy the portrait of the greatest enemy of France, our Emperor William. But the picture looks as if Vidal intended to take revenge in a photo-chromical way for the political defeat of his native country. As a basis he made use of a photograph by Loescher and Petzsch. The colour work of this picture is done in photo-chromy; but it appears as unnatural as possible, and it is the plainest proof that the assertion *Photography en couleurs naturelles* is only humbug.

The pictures of objects of mechanic arts, produced in the same way, are prettier. In many cases they can be done in a very simple manner by means of the carbon printing process. M. Prumm, of this city, has made a picture of a fine sword, gilded and beautifully ennobled, by transferring the carbon print on glass, and pasting a piece of gold paper on the back. The picture looked then as if taken on a gilded background.

While I am speaking about the carbon process I will remark that they have tried here several times to introduce to the public the beautiful window pictures in carbon. Schaarwachter and Richardt exhibited many of them, but without success; the public prefer decidedly the paper pictures. Hereby I should not conceal the circumstance that the large carbon prints transferred on glass are not always durable. I am not speaking of the fading of the added red colouring stuff which changes the tone of the picture, but of the cracking of the film. All large pictures Schaarwachter produced in this manner are spoiled by cracking of the film, and on some of my own pictures the same fault appeared after a few weeks. I suppose this fault can be prevented by coating the glass on which the picture is to be transferred with gelatine; for the Woodburytype, which are brought in the market in large quantities, show no cracking.

For enlargement, the carbon process is coming more and more into use. The best method is that which I described some time ago. We have to prepare in the camera, by means of collodion, an enlarged diapositive from the small negative. Then we have to copy a carbon negative, which is to be transferred on glass; and from this we then print the positive picture. To the American photographer this method may seem perhaps too complicated; because for him, with so much bright sunlight, such a circuitous way is not necessary. But for us, with our gray northern sky, having even in summer very often dark days, the case is different, and the photographers of enlargements are in search yet of an artificial light fit for use.

In a previous letter I mentioned my testing experiments on the chemical strength of the electro-magnetic light. Recently I had occasion to test the light of a battery containing fifty of Bunsen's elements. The light appeared very glaring, but the strength was of inferior value. I had to expose my photometer eleven minutes before it showed fifteen degrees. I can produce the same effect cheaper with one and a-half grammes of magnesium wire.

There is at present much discussion about the worth of the carbon process, as I learn by your valuable periodical. I believe myself that the carbon process for small pictures can never displace the silver process, but gradually will come into use for large pictures. The great difficulty with which at first the process had to labour in warm weather is now removed in an easy manner. At the Royal Polytechnical Academy we are proceeding on warm days in the following way:—

1st. Prepare a bath:

Bichromate of potassium	...	...	4 parts
Water...	...	...	70 "
Alcohol	...	...	30 "

The same to be cooled by ice-water.

2nd. The carbon tissue is dipped in, back up, turned over quickly, so that the liquid moved so that the surface of the sheet will be moistened entirely, and then taken out immediately. During this operation the bath is coloured a little black by the paper, but while drying it does not run down even by 90° F. It is to be noticed that the tissue sensitizes quicker in high than in low temperatures, and therefore it needs only to remain in the bath for a short time. The paper is dry after two or three hours.

3rd. The copied papers are coated with plain collodion (one per cent. cotton), and dried in a dark place, then transferred by the squeegee, and developed. In this manner the work is just as safe as in winter time. By this process the reticulation and granulation of the film occur but seldom.

Speculative photographers have tried to join with the Russian or Turkish army, but till now have not succeeded, and, on account of mistrust, for fear they should make use of their art for treacherous purposes. In this war, it seems that photography will not perform an essential part, if Englishmen or Frenchmen are not more successful.

How many photographers are there in the world? What quantity of chemicals are they using? This question has recently occupied my mind very much. The answer is no easy one, and can be given only in part. In Germany the number of established photographers is a little over three thousand; in Austria and Hungary, about the same; and I hardly believe that this number will be exceeded in France or England. For Italy, Spain, Turkey, Sweden, Norway, and Russia, we can count only half the number, which gives the round number of twenty thousand established photographers in Europe. This number may be a low one in comparison with America, where, among forty millions of inhabitants, can be counted six thousand photographers. And in comparison with this number the consumption of albumen paper seems to be inferior. Germany manufactures the main part of it, which amounts to twenty thousand reams yearly. About one-third part is manufactured in other countries, so that to every photographer there is about one ream of paper. But the consumption of silver cannot be figured out so readily. In Germany the average use of nitrate of silver is three pounds yearly for each photographer, but in Austria, only one pound yearly. The reason is that there are existing in Germany large reproduction establishments, which Austria cannot show, and which are consuming a large quantity of silver. About the consumption of silver in other countries I could get no sufficient data.

The quantity of Bristol board consumed is an enormous one. In Germany forty millions of Bristol boards, cut in cartes-de-visite, are used annually. In fact, the photographer is giving out more money for Bristol board than for silver. Philadelphia Photographer.

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BY A. STOCK.†

UNTIL now it has been customary to treat silver baths, whether they have been employed for the dipping of plates or sensitizing of paper, in precisely the same way when defective or out of order, notwithstanding the fact that the print bath becomes contaminated with quite a different series of organic compounds and impurities. This should not be, for the latter requires, as a matter of course, special treatment, although, strange to say, no manual gives any definite information on the subject. The ordinary impurities that enter the print bath are gelatine or size, superfluous acid, and combination of the latter with the chloride salts employed in the preparation of the paper. The precipitation of

the gelatine matter, as of the organic compounds, is brought about by the following means:

1. The silver bath is treated with alum solution 1:10 strength (ordinary alum dissolved in hot distilled water), until small crystals are seen to form, when the liquid is filtered. These crystals are silver albuminate, which are dissolved again in hot distilled water, and added to the silver bath again; a portion remains dissolved, while the rest again separates. This silver albuminate may be employed, therefore, again and again.

2. By adding and filtering off again burnt alum or hydrated clay, for, as is well known, the oxyhydrate of aluminium possesses a considerable tendency to combine with organic substances, and precipitate the same when in solution. As the hydrated clay exerts the same action against colour, it is far preferable to permanganate of potash when any discolouring of the bath takes place.

If the print bath is acidified pretty strongly with acetic acid, and the kaolin added until the smell of acetic acid has disappeared, and the whole filtered, then the sizing material is also completely coagulated by the acetate of aluminium which has been produced.

There remain still the different acids and their salts to neutralize and decompose. To do this, carbonate or bicarbonate of soda has hitherto been recommended to be employed. Now, although both those compounds, and especially the latter, are excellent agents for neutralizing the silver bath, I have never found the result to be a marked improvement in the bath.

On the other hand, we possess in caustic potash and soda two excellent means in neutralizing and decomposing acids and salts present in the print bath. Both are dissolved in ten parts of distilled water. From one of the two solutions (the first is to be purchased of any chemist) enough is added to bring about a gelatinous precipitate, the liquid being from time to time vigorously shaken. The silver bath now assumes a transparent, milky turbidity, or, if it does not, more caustic potash is added, until the turbidity does not disappear, and litmus paper betrays a neutral reaction. This gelatinous precipitate cannot be filtered off, either by means of bibulous paper or cotton-wool, as all the pores are very soon plugged, and only moistened linen or flannel can be used for the purpose. The linen or flannel is strained tightly upon a square wood frame, and the liquid poured in the middle; the strainer must not touch at the bottom, but remain free. Neither must it be pressed, as in that case some of the gelatinous precipitate is forced through. It is well to let the filter process go on during the night, and then there is plenty of time for the liquid to run through bright and clear. Those who are not conversant with this method of filtering or straining should be initiated into it by a chemist. After the operation the cloth may be dried, and be employed again. In adding various substances to the print bath in order to purify it, one need not be nervous about going to work, for there is no harm in being a little out, and the print bath does not require such delicate handling as is the case with the negative bath.

Print baths treated in the manner described will be found to possess all the properties necessary to good working, and to impart to albumenized papers the finest lights and shadows. At the same time, the restoration of a print bath should not be delayed for any length of time, as sometimes happens with the negative bath, but should be treated periodically, especially so far as neutralization with caustic potash is concerned. If the bath becomes too alkaline, it may easily be rendered neutral again, after straining, by the careful addition, drop by drop, of pure citric acid.

In the above lines I have desired to indicate the theory involved in the proper restoration of the print bath, and thus to acquaint my friends with the why and wherefore of the reactions.

Dr. Liesegang, in connection with the subject, points out the method employed by Mr. Maxwell Lyte to purify a turbid, brown print bath, a method which Dr. Liesegang

* Philadelphia Photographer.
† Photographisches Archiv.

has somewhat simplified. The following solution is prepared:—

Spring water	100 grammes
Phosphate of soda (crystallized) 5 ..	
Carbonate of soda (crystallized) 20 ..	

To every litre of brown print bath are added ten grammes of the above solution, the whole being vigorously shaken and then filtered. The bath runs through the filter perfectly bright and clear. Afterwards for every ten grammes of the above solution that have been employed, there is added to the print bath one gramme of nitrate of silver. The residues collected upon the filter-paper should not be thrown away, but added to other silver residues to be worked up at a fitting opportunity.

EMULSION MANIPULATIONS.

BY H. J. NEWTON.*

ALTHOUGH so much has been said and written on the mode of developing and the general manipulation in the production of an emulsion negative, there still appears to be a call for light, and from some quarters this cry is fierce and sharp. The fact appears to be overlooked by some that by making a conspicuous display of their failures they put themselves in strong and unfavourable contrast with those who succeed, and to a great extent justify adverse criticism as to their intellectual capacity.

To avoid the necessity of answering some correspondent almost every day, I will give in minute detail my mode of manipulation in producing an emulsion negative.

First, prepare the plate either with albumen or talc. If with albumen, prepare it as follows: White of one egg dissolved in eight ounces of water; after the solution is complete, add eight ounces of water to which have been added sixteen drops of carbolic acid. Ammonia in the albumen should be avoided. If talc is used, clean the plates with undiluted sulphuric acid; wash well, and wipe dry with a clean cloth which has been washed in water containing washing soda instead of soap, and when dry apply the talc. If the plate is to be exposed and developed while wet, place it in clean water as soon as the film is set, and let it remain until the greasy lines are washed off (after this is accomplished, it will not injure it if it remain in the water for a week); expose, and before developing flood the surface with water, in order that the developer may go smoothly over the surface. A quantity of the soda solution, sufficient to cover the plate, is poured into a wide-mouthed vial, and, just before using, a few grains of pyrogallie acid are put into it, which dissolves in a few seconds by agitating the soda: then flow over the plate. The flowing of the plate with the developer can be done moderately, as nothing is gained by dashing it on as many do the iron developer in developing a bath negative. If the plate has been over-exposed, the appearance of the negative on the application of the developer will be the same as that of a bath plate.

I would advise any one commencing the use of emulsion to expose one or more plates in this way: Prepare a plate, and give it three exposures by drawing the slide so as to expose one-third of the plate, and after ten seconds draw it so as to expose two-thirds of the plate, and give this ten seconds, and then draw the slide so as to expose the whole plate, and give this ten seconds. In this way the first part of the plate gets thirty seconds, the middle part twenty seconds, and the last ten seconds. By developing a plate so exposed, you can approximate very near the proper time for the light you are working in.

The great variation in the actinic force of light in different localities is a fact, to a great extent, overlooked by photographers. The light from the rear windows of my residence in the yards between the residences on Forty-second and Forty-third Streets is at least twice as strong in actinic force as that in the Central Park, three quarters

of a mile away. Before going to the Park to expose plates, I always expose a small plate from my window at the rear of my house, and if fifteen seconds makes a good negative, I invariably give from thirty to forty seconds in the Park. The most striking illustration, however, of the difference in different localities of the actinic force of light I observed in making negatives at Niagara Falls. Plates which required thirty seconds' exposure in New York were fully exposed at the Falls in from three to six seconds.

From these facts it will be observed that when one attempts to state definitely how much exposure should be given for a specific quality of emulsion, the chances are that he only would mislead; for this reason it becomes necessary to expose a plate as above directed, and thus determine the action of light in which the emulsion is exposed.

If the plates are to be used dry, the process of development is the same. The plate should be thoroughly washed before applying the developer. I usually, however, flow the plate after washing with a pyrogallie acid solution, from three to six grains strong, until the faint outlines of the image appear. This pyro solution can be used repeatedly for several hours.

I determine in this way whether the exposure has been long or short. If the image comes out quickly and has a reddish appearance, it indicates an over-exposure. I then reduce my soda solution by adding a small quantity of water—in the first place one-fourth—and determine by its action how to treat the next plate.

Some failures to get good negatives from emulsion have been caused by washing the plates in water unfit for the purpose. Organic are less objectionable than mineral substances in the water. Water from melted ice is always good for this purpose.

The greater the quantity of pyrogallie acid used, the more intense will be the negative. There is, of course, a limit to this effect of pyro. If the negative after fixing needs strengthening, use the iron and citric acid as follows:

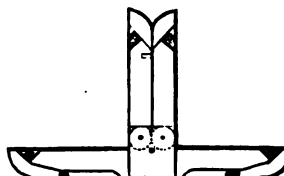
No. 1.—Water	16 ounces
Protosulph. iron	1 ounce
Citric acid	$\frac{1}{2}$ "
No. 2.—Water	1 ounce
Silver	20 grains
Nitric acid... ..	6 drops

Pyro and citric acid can be used, but are more likely to produce stains, and in my hands are not so satisfactory as the iron.

AN IMPROVEMENT IN THE FIELD CAMERA STAND.

Anthony's Photographic Bulletin says:—

"This is a suggestion of Captain A. J. Russell, who has had a large experience in practical out-door photography. Conceiving the idea to be of considerable importance, we have secured letters-patent on it, and take pleasure in presenting it for the approval of the trade.



"The accompanying diagrams of the top, open and closed, will very readily convey an impression of this serviceable little improvement, which enables the out-door photographer to quickly dispose of what has hitherto been one of the most troublesome parts of an outfit to be carried.

"The peculiar form of the old tripod too required, in

* *The Photographic Times*.

packing, a certain amount of space quite disproportioned to its weight. Russell's tripod top, it will be seen, folds into a perfectly straight piece, which can easily be carried in the pocket. Being made of hard wood, and tipped with brass plates, it is thoroughly firm and substantial. The legs do not fold. The price is \$7 50, complete."

THE CYANOTYPE PROCESS.

It is not unusual, as every photographer knows, for a process to remain *perdu* for some years, and then to get made known again with some mystery and circumstance. We see old friends revived in this way from time to time, and, like somebody whom we meet for the first time in a quaintly shaped hat or a different-coloured coat than usual, we fail to recognize him at the first moment of our rencontre. But it is only for an instant that the deception holds good, and the well known features are as apparent as ever as soon as we get on close terms again. The cyanotype process, as Sir John Herschel used to call it, is the latest attempt at "fraudulent enlistment," and the circumstance that we have here to do with a genuine article, and not a spurious one, does not make the deception the less barefaced. The cyanotype process as practised by Sir John Herschel is a very simple affair, and one that is found extremely useful for copying outline sketches or multiplying tracings, instead of using tracing-paper. Sir John Herschel employed it, as does Professor Herschel, of Newcastle, to the present day, for making copies of their calculations of astronomical tables, the characters or figures being produced in white upon a blue ground. The paper, ready prepared for use by draughtsmen or others, is to be purchased in Paris; and also, we believe, in this country, of Messrs. Marion, of Soho Square; but those who desire to make it for themselves can easily do so. Good, smooth paper is treated with

Citrate of iron (or ammonio-citrate)...	140 grains
Red prussiate of potash	120 "

Dissolved together in two fluid ounces of water. The solution can be kept in a glass-stoppered bottle well wrapped up in a dark cloth, or shut up in a dark cupboard, for any length of time. It is applied by means of a brush or tuft of cotton-wool, and the surface dried in the dark. The paper is exposed to light under a tracing, being kept flat by glass plates, and the print fixed by washing in clean water for a few minutes. The ink lines of the tracing must be of an opaque black, such as India ink, &c., to prevent the rays of light from passing, and, as a matter of course, the copy will not be sharp unless the paper is kept firmly in contact with the tracing.—*Times*.

THE CAUSE OF RETICULATION IN CARBON PRINTING.

BY ADOLF OTT.*

AMONG the chief difficulties attendant on carbon printing may be ranked reticulation, a phenomenon which appears sometimes in tissue that is otherwise faultless. This defect has already given rise to much discussion; indeed, one may say that it has become the question of the day among carbon printers and in the photographic journals, and all sorts of means have been suggested with a view to remedying the evil.

The cause of reticulation is attributed by some to a too rapid drying of the tissue, and by others to the operation being conducted too slowly; others, again, put down its cause to the use of a weak bath, or to the addition of acid in the warm development bath, &c. Nobody, however, seems to have thought that the reason was connected in some way with the condition of the atmosphere around.

We do not wish to assert that reticulation is alone and only due to the state of the atmosphere, for this would not at all coincide with the conditions under which it has

been from time to time observed. For instance, it has been found that prints in the establishment of M. Braun, produced by the double transfer process, exhibited the evil, while other pictures secured at the same time, and with the same tissue, but by the single transfer process, were altogether free from the defect. A careful examination with a magnifier quite failed to show any tendency of reticulation in this latter instance, although it was distinctly seen in the other. This circumstance is in harmony with the fact observed by Woodbury, that the addition of certain pigments to chrome gelatine gives rise to a grain-like network, which some gelatines show more readily than others. In all these changes the gelatine seems to lose a good deal of its adhesive properties. In dilute alkaline solutions pigment pictures also quickly become reticulated, and then dissolve readily from the paper.

Without particular care is taken, reticulation also occurs, one might almost say invariably, when the air is charged with electricity, as, for instance, just before a thunderstorm. Manufacturers of gelatine are, indeed, well aware that during a storm of this kind the material is readily decomposed, while of my own knowledge I can say that the same kind of decomposition is to be brought about by passing a galvanic current through a gelatine solution; this M. Ferdinand Brown has amply proved by experiment. It seems as if there are in this, as in other organic substances (I am speaking now of non-sensitized tissue), microscopic organisms which are set into more energetic activity by the electric medium. The circumstance is known to all that milk soon becomes sour in a thunder storm, and exhibits organisms under a microscope. A Frenchman has, indeed, suggested that the action of yeast, or fermentation, might be facilitated with the aid of electricity.

Under the supposition that the drying is undertaken in as cool as possible an apartment, the addition of spirit to the chromate bath to the extent of about twenty-five to thirty per cent. is to be recommended. Firstly, because in this way the drying of the gelatine is thereby hastened; and, secondly, because the alcohol acts, very probably, like carbolic or salicylic acids, as a preservative. The finely-powdered bichromate is first of all dissolved in water in the proportion of—

Bichromate of potash ...	4 to 5 parts
Water	70 to 75 "

and when the bichromate has been all dissolved, the spirit is added. As a rule, a very fine precipitate is formed, which must be filtered off. And, by the way, I may remark, that it was not Vidal, but an American gentleman, Land, who first suggested this addition of alcohol.* Land thought to avoid the running of the gelatine film in this way, and he recommended an addition to the bichromate bath of twenty-five to forty-five per cent. of its volume of alcohol, when working at a warm temperature, such as 90° to 100° Fahr. At M. Braun's establishment at Dornach the addition of alcohol to the bichromate bath has been customary for a long time.

Friedlin, of Munich, recommends, as a preventive, carbolic acid, and gives the following formula for the bichromate bath:—

Bichromate of potash ...	120 grammes
Distilled water	3200 "
Carbolic acid (fluid) ...	4 "

I have not sufficiently experimented to pronounce upon this formula, but I cannot help thinking that a small addition of carbolic acid would be beneficial.

The decomposition of bichromated gelatine by the atmosphere seems based on purely chemical reaction, for it can hardly be supposed that such delicate organisms as those which are formed in decomposing gelatine could withstand the action of bichromate salts. A few experiments would, however, soon settle the question; my task was simply to put photographers on their guard during the present hot and stormy weather.

* *Photographische Correspondenz*.

* See *Philadelphia Photographer*, 1866, p. 375.

The Photographic News.

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THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE forty-seventh annual meeting of the British Association has just closed, in the fine city of Plymouth, where thirty-six years before the peripatetic philosophers held festival. As we have more than once remarked, in reference to recent annual meetings of the Association, photography as a special science has been gradually ceasing to receive attention. When the Association was young, photography was still younger, its discovery having been announced when the Association had only been a very few years in existence. As was quite natural, the little stranger was heartily welcomed, and its new developments, capacities, and requirements, were studied year by year. Chemists and physicists were eager in their investigations and experiments in various branches of the new art-science, and at every meeting of the Association many papers directly connected with photography were read by distinguished savans.

The days when Wheatstone and Brewster and men of similar stamp took a working interest in the art and its possibilities have passed, and photography has ceased to be regarded so much as a science in itself, as an established recognized and understood aid to investigation in other sciences. And in this aspect photography still appears prominently at the meetings of the Association. Captain Abney, Mr. Mallock, and Lord Rayleigh, read interesting papers more or less connected with photography, and many other gentlemen described the application of photography as contributing to their investigations. In the department of Anthropology, Mr. Francis Galton referred to some interesting uses of photography. In searching amongst the habitually vicious classes for some general and similar outward indications to mark mental characteristics, he remarks that by some trustworthy method of observation and record of this kind "we should learn how far the more obvious physical characteristics may be correlated with certain mental ones, and we should, perhaps, obtain a more precise scale of temperaments than we have at present. Having obtained drawings or photos. of several persons alike in most respects, but different in minor details, what sure method is there of extracting the typical characteristics from them? I may mention a plan which had occurred both to Mr. Herbert Spencer and myself, the principle of which is to superimpose optically the various drawings, and to accept the aggregate result. Mr. Spencer suggested to me in conversation that the drawings reduced to the same scale might be traced on separate pieces of transparent paper, and secured one upon the other, and then held between

the eye and the light. I have attempted this with some success. My own idea was to throw faint images of the several portraits in succession upon the same sensitized photographic plate. I may add that it is perfectly easy to superimpose optically two portraits by means of a stereoscope, and that a person who is used to handle instruments will find a common double eye-glass fitted with stereoscopic lenses to be almost as effectual and far handier than the boxes sold in shops. It is needless to enlarge on the obvious fact that many persons have become convicts who, if they had been afforded the average chances of doing well, would have lived up to a fair standard of virtue. Neither need I enlarge on the other equally obvious fact, that a very large number of men escape criminal punishment who in reality deserve it quite as much as an average convict. Making every allowance for these two elements of uncertainty, no reasonable man can entertain a doubt that the convict class includes a large proportion of consummate scoundrels, and that we are entitled to expect to find in any large body of convicts a prevalence of the truly criminal characteristics, whatever these may be."

Again he remarks, on this subject:—

"The ideal criminal is deficient in qualities that oppose his vicious instincts. He has neither the natural regard for others which lies at the base of conscience, nor has he sufficient self-control to enable him to consider his own selfish interests in the long run. He cannot be preserved from criminal misadventure, either by altruistic or by intelligently egotistic sentiments. It becomes an interesting question to know how far these peculiarities may be correlated with physical characteristics and features. Through the cordial and ready assistance of Sir Edmund Du Cane, the Surveyor-General of Prisons, who has himself contributed a valuable memoir to the Social Science Congress on the subject, I was enabled to examine the many thousand photographs of criminals that are preserved for purposes of identification at the Home Office, to visit prisons, and confer with the authorities, and, lastly, to procure for my own private statistical inquiries a large number of copies of photographs of heinous criminals. I may as well say that I begged that the photographs should be furnished me without any names attached to them, but simply classified in three groups according to the nature of the crime. The first group included murderer, manslaughter, and burglary; the second group included felony and forgery; and the third group referred to sexual crimes. The photographs were of criminals who had been sentenced to long terms of penal servitude. By familiarising myself with the collection, and continually sorting the photographs in tentative ways, certain natural classes began to appear, some of which are exceedingly well marked. It was also very evident that the three groups of criminals contributed in very different proportions to the different physiognomic classes. I have thus far spoken of the character and physiognomy of well-marked varieties of men. The anthropologist has next to consider the life history of these varieties, and especially their tendency to perpetuate themselves, whether to displace other varieties and to spread, or else to die out. In illustration of this, I will proceed with what appears to be the history of the criminal class. Its hereditary perpetuation is a question that deserves more careful investigation than it has received, but it is on many more accounts more difficult to grapple with than it may at first sight appear to be."

We have selected these examples of the uses of photography in a somewhat novel field as likely to interest many readers, and as suggesting the importance in photographs for purposes of this kind of presenting unsophisticated pictures. Naked photography is not always absolutely true, but the nature and amount of error may be estimated and allowed for; whilst the modifications produced by retouching are beyond estimate.

Some further details of the Association's doings will be found on another page.

PHOTOGRAPHY IN AMERICA.

BY NORMAN MAY.*

OWING to the much clearer atmosphere and greater amount of actinism in the light, exposures are much shorter in America than in England's "muggy" climate. I have seen printed over fifty prints from one whole-plate negative in a day; of course the negative was rather thin (don't think the story is too), and it was printed in the sun, but they were all off by three o'clock. In consequence of the brighter light, American photographers, as a rule, are very successful indeed with children, catching, almost instantaneously, their often charming and always fleeting expression. I remember seeing at a Canadian exhibition a frame filled entirely with children's photographs, the majority of them babies, the various expressions, from grave to gay, being exquisitely rendered. Fogs are rare, and the drizzling rain so common in England is there almost unknown. When it rains, it generally rains heavily, and it's no uncommon thing to have hail-stones as large as marbles, which, pattering on the shingled roofs, make a great noise. Lightning is of nightly occurrence in the hot summer of the Western States, generally sheet or heat lightning, forked lightning only occurring in a storm, but then extremely vivid. Altogether, it is a country of much greater extremes than England in every way. The mountains are higher, rivers are larger, the cold is greater, and heat more intense, big cities spring up with big hotels, long railways go across immense plains, go through almost interminable forests, down into deep valleys, and over high, snow-clad hills.

It is a country of inexhaustible resources, great enterprise, and wonderful vitality, with circumstances in favour of its future that no European power possesses. Everything has lately been done at too high pressure speed, but even now that is being amended, and when this period of commercial depression is past, everything will find its level, and they will prosper again, if more slowly, yet more steadily and surely.

The emigrant, should he fail to do as well as he expected, will find the experience he has gained, the new ideas he gets, and the enlargement of his general knowledge, amply repay him for his expenditure and loss of time.

In drawing these remarks and imperfect jottings to a close, I will endeavour to disabuse the mind of the intending emigrant of the idea that the American photographers are in any way inferior to the English, and that his abilities will be recognized as pre-eminent. English people are not liked so well by the Americans as the Germans, who make far the best settlers; and the emigrant will find he must give up entirely his old notions, begin afresh, and adapt himself to the people. If he cannot do that, he has not a shadow of a chance of success.

BRITISH ASSOCIATION.

THE real work of the Association commenced on Thursday morning week with the addresses of the Presidents of the several sections, and the attention with which the introductory address by Professor Allan Thomson, on the previous evening, had been listened to, showed that the members were fully equal to the labours which they prospectively had to bear. In our columns it would be unwise to discuss the character of the President's address; suffice it to say, that amongst those who understood the biological questions involved, it was deemed a masterpiece, and to show the growth of Darwinism in the last ten years. It is only in Section A (Mathematical and Physical Science) and in Section B (Chemical) that matters photographic are discussed, unless it be in the Geographical Section, where the aid of the art-science to travellers is discussed. In the present year, the only

points which have been raised having a photographic bearing have been in Section A. In the address of Professor Carey Foster, with which the proceedings were opened, we have a really practical proposition, and one which, in the interest of science, it is to be hoped may be carried out. He proposes that committees formed of eminent men of science shall be appointed to draw up reports of the progress of the different branches of physical science as a record, and present them to the British Association. He does not propose that the reports shall be annual, but that each year a report on some one branch of science shall be presented for insertion in the proceedings. Thus in one year there should be a report on the progress of optics, in another of astronomy, and so on. By the adoption of this plan it is evident that if the reports be carefully drawn by men eminent in those branches of science on which the report is to be drawn, and who represent all complexions of opinion, a most valuable addition to the work of the Association will be produced, and one which will lend a much greater value to the annual reports than at present attaches to them. Should such a plan be adopted, which we have every reason to hope will be the case, we may feel confident that photography will not be neglected, since in nearly all physical research it has proved, and still more might prove, a valuable handmaiden to the scientific worker.

There are indisputable proofs that photography at present has not been utilized to its fullest extent in these researches; and the cause is not far to seek. The man who is occupied in physical research is rarely a practical photographer; and in many cases of which we are aware, the difficulties to be surmounted in learning the art have debarred its employment when it would otherwise have been utilized. It may perhaps be too much to say that one of the elements of all scientific education should be to include a thorough knowledge of photography; but at all events, the progress in science shows that a practical acquaintance with its rudiments is daily becoming more and more a necessity. The reports suggested by Professor Foster will in all probability help to give the needful stimulus in this direction, since they cannot do otherwise than show the labour that may be saved by using a sensitive plate as a recording agent, instead of the eye.

The opening address of Professor Abel, F.R.S., was also well worthy of the attention with which it was heard. His reproof to those young workers in organic chemistry whose sole proof of a new compound might, perhaps, consist solely of the determination of a boiling point, was particularly happy. He also ably supported the claims of analytical chemists against the synthetical workers, and his dictum that the discoverer of a good analytical process was certainly on an equality with the discoverer of a new organic compound was greeted with an applause which showed that the true spirit of chemical science was fully appreciated by the majority present. Whether it be that photography has sunk to a more commercial status than in its earlier days, or that those who practise it are not of the same stamp as in those days when the names of Herschel, Hunt, Claudet, and such were heard at the British Association in connection with it, may be a disputed point. One thing is, however, quite clear: the prominent position which it should occupy at the British Association is not maintained, though we have no hesitation in saying that it might be restored.

The subjects of principal interest during the meeting have been the Telephone and the Colorado Beetle. Dr. Bell, the inventor of the Telephone, met with a most hearty reception, and the experiments he carried on with Mr. W. H. Preece will long live in the memory of the Association.

There have been the usual soirées on two evenings, an art exhibition having been included in their attractions. This exhibition was replete with high-class paintings, both in oil and water colours, lent by various nobility

* Continued from page 398.

and gentry of the county and neighbourhood, and was well worthy of a careful inspection. It was free to all members of the Association, many of whom have taken advantage of the privilege.

Subjoined will be found reports of papers by Captain Abney, F.R.S., Professor Vernon Harcourt, and Lord Rayleigh, F.R.S. A communication by Mr. A. Mallock, on "Measurement of Height of Clouds," we are obliged to hold over till next week.

ON A METHOD OF SHOWING THE SUN'S ROTATION BY SPECTRUM PHOTOGRAPHY.

BY CAPTAIN ABNEY, F.R.S.*

THOUGH it is now generally admitted that the approach or retrocession of the stars towards our system can be observed by means of the displacement of the absorption lines of their spectra towards the most or least-refracted end of the spectrum, yet, in the minds of some, there still exists a lingering doubt of the truth of the process employed. If, however, the displacement of the absorption lines due to the rotation of the sun can be shown to agree with the theory, all doubt must be removed. Huggins, Christie, and Young have proved the solar rotation to their own satisfaction; but with the methods employed there might be some danger that the displacement noted was due to some other cause. I have made some experiments lately in the same direction, which have, I think, been fairly successful in conclusively demonstrating the truth of the problem, the manner of which I will briefly describe:—

A condenser was prepared by cutting a lens across the centre and mounting the two halves side by side, in such a manner that the two images formed by the sun were tangential one to another, the tangent being parallel to the horizon. The light from the sun was thrown into this condensing arrangement by means of a heliostat having a mirror silvered on the surface; and the images were brought to a focus on the slit of a spectroscope, the point of contact of the two suns occupying a position half-way down the slit. To the spectroscopic apparatus was attached a camera and lens of some six or seven feet focal length, and the spectrum was thus formed on a sensitive plate. When the north and south points of the sun's image were tangential, evidently no displacement of the two portions of the spectrum formed by the upper and lower halves of the slit should be seen; whereas, when the equatorial portions of the images were in contact, the displacement of the lines should be that due to double the rotation, since the eastern limb should be receding and the western advancing.

Thus, if photographs were taken in the morning, at noon, and in the evening, the apparatus remaining in the same position, it is evident that a displacement of the lines in the top half of the spectrum should first be noted in one direction; next, there should be no displacement of the lines; and, finally, there should be a displacement of the lines in the top spectrum in the reverse direction to that first noted. On the two separate occasions on which I have devoted a day to this subject I have found such to be the case. In the first I was using a refraction apparatus of considerable power; in the second I employed a diffraction grating by Rutherford, of over 17,000 lines to the inch, which Mr. Lockyer kindly placed at my disposal. The fourth order of the spectrum in the last case was employed, and that portion lying about the H lines was taken to test the method. I have not had sufficient time to measure the displacement of the lines, but as far as I have gone, the truth of the method first employed by Huggins, as applied to the stars, is fully borne out.

* Read before the British Association in Section A—Mathematical and Physical Science.

A NEW STANDARD UNIT OF LIGHT.

BY V. HARCOURT.*

PROFESSOR VERNON HARCOURT introduced a new standard light for photography to the meeting. He first described the difficulties encountered in measuring the light of gas, owing to the variation in the light of the standard sperm candles due to one cause or another. Thus the height of the barometer and thermometer had always to be taken into account in order to correct the results. The Carcel lamp unit he also alluded to, and pointed out that the uncertainty of the composition of the oil, the height of the wick, and other points, were disturbing causes in the intensity and quantity of the light. In order to get a standard light, he had fixed certain requisites: first, that the combustibles should be of a known composition; and, second, that the same amount should be burnt in a given time, also that the atmospheric changes should have a minimum effect. These conditions he effected by distilling petroleum at 50° Cent., and collecting the distillate. One volume of this petroleum in a vaporised state with three of common air gave the necessary combustible, which could be held in a gasometer. A unit of his light consumed half a cubic foot an hour when burnt at an orifice of a quarter of an inch in diameter. The colour of the flame seemed very similar to that of the ordinary gas flame, and hence was suitable for the purpose required of measuring the illuminating power of the latter. By using a gas to give a standard light, no correction for temperature or pressure is required, since it and the gas under examination are similarly affected. Perhaps such a standard light might be useful to photographers by which to determine sensitiveness of various photographic compounds. The expectation of the Section was raised to hope that perhaps some definition of what really constituted white light might be given; but they were doomed to disappointment.

THE LOWER LIMIT OF THE THERMAL SPECTRUM.

BY LORD RAYLEIGH, F.R.S.*

LORD RAYLEIGH read a paper on "The Lower Limit of the Prismatic Spectrum," in which he alluded to the researches of Sir J. Herschel on the thermal spectrum. (See Hunt's "Researches on Light" for a figure). He gave a resumé of the two methods Sir J. Herschel adopted of tracing the limits of the spectrum. In the first, he coated one side of a paper with lamp-black, and then brushed alcohol over the other and exposed. The portions where the dryings first took place indicated the thermal maxima. These points he had called α , β , γ , and δ , and stated he also found traces of another maximum ϵ . Lord Rayleigh had repeated these experiments, but with different results to those above mentioned. He found that he got no results beyond β . What led him to undertake the investigation was the theoretical probability that the change in the refractive index in a prism for different rays must have a limit, and if such were the case the thermal spectrum should stop abruptly. He explained how this theoretical limit was arrived at. If the prism receiving the sun's rays were set at the angle of minimum deviation for each ray, and the length of the spectrum were taken as the abscissæ, and the ordinates formed of the refractive indices, it would be found that on joining these ordinates a nearly straight line was formed, which would cut at a certain distance from the limit of the visible spectrum, between which points the invisible thermal spectrum must lie. The limit of Sir John Herschel's thermal spectrum lay far beyond this point, and it was to rectify these results that Lord Rayleigh undertook the investigation. By the alcohol method he found his own to agree with theory. In order to further test his results, he repeated Sir John's experiments, which he made by brushing over paper—whilst

exposed to the spectrum—ferricyanide of potassium and oxalate of iron. This combination readily changed in the thermal rays to a brownish colour, eventually changing to Prussian blue. In these experiments he found the same results obtained. He had brought before this Section these experiments in order to obtain an elucidation of the seeming discrepancies. He said that if the base of the prism used by Sir John were polished, the internal reflections from the surfaces, perhaps, might be the cause of it. (This was the case in the prism that Sir John used). In answer to questions put to him, Lord Rayleigh stated that, although in his experiments he had employed a carbon disulphide prism, yet he had obtained the same results when using flint glass or rocksalt prisms.

Mr. Spottiswoode said that in some polarized heat experiments he had found an abrupt termination of the thermal spectrum.

Captain Abney, on being called upon by the President, said he had not much to add in the matter. In photographing the ultra red end of the spectrum, he had found that the state of moisture in the atmosphere had affected light obtainable in a marked degree, and suggested that this, perhaps, might be the cause of the discrepancy.

Lord Rayleigh said that he had placed a cell containing water before the prism, and had found it diminished the length of the thermal spectrum considerably; but he did not think this accounted for it altogether. Four inches of water, he said, represented the moisture in the air when entirely saturated, and the thickness of water he used was a fair representation of the amount that might be expected to intervene between the sun and the prism. He hoped other experimenters would repeat his experiments.

ASSER'S PHOTO-LITHOGRAPHIC PROCESS.*

THE Asser process differs from those generally in use principally in regard to the paper employed, which is not sized or gelatinized, and, consequently, though bad for transferring, nevertheless is capable of fulfilling a special rôle. Asser employs an unsized paper, which he simply coats with a little starch paste, dries, and floats upon a bichromate bath. It is possible by means of his process to secure prints in greasy ink from portrait-negatives, which exhibited in the half-tones an agreeable grain, and were very similar to Lichtdrucks which have been pulled from grained glass plates. The half-tone is very well reproduced, and it is evident that in certain directions the process will find many applications.

As the process, though an old one, has not recently been referred to, an account of the *modus operandi* may be welcome. You take unsized paper of medium thickness, and of as fine a texture as possible, and apply to the surface of the same, by the aid of a clean sponge, a thin film of starch dissolved in water. After the paper, hung up on a pin, has dried, it is floated, the coated side uppermost, upon a saturated solution of bichromate of potash in distilled water, with which it is at once impregnated; consequently the paper is permitted to float upon the solution but a very short time. It is then hung in the dark to dry, and at the lowest corner is put a tiny piece of bibulous paper to absorb the superfluous liquid.

As soon as the paper has completely dried, it is put into a printing-frame, the starch-coated side against the negative, which should be pretty vigorous and clear. After printing for a longer or shorter time, a clear, brown image appears upon an orange-yellow ground. When sufficiently printed, the paper is put, image uppermost, in a water bath, care being taken that no air-bubbles are formed between paper and water.

It is allowed to float on the water (in the dark) until all the bichromate of potash which has not been acted upon by light is dissolved out, and the picture appears clear

and of a light brown colour; it is then taken out of the water and dried, first of all between leaves of blotting-paper, and then in the air. After drying, the picture is put upon a marble slab, made very hot, taking care, however, that the print does not become brown by heating. By undergoing this operation of heating, the chromate salt is endowed with the property of readily attracting the printing ink.

A piece of unsized paper, rather smaller than the picture, is now moistened, flattened upon a piece of patent plate, and the superfluous water removed by the aid of filter paper. Then the image is floated upon its back for a few seconds upon warm water until the water has moistened through the paper and wetted the coating of starch. The image is then taken out of the water and placed upon the sheet of moist paper lying upon the patent plate; in this position the two surfaces are placed in contact, and covered with a dry sheet of sized paper, the latter being rubbed over in all directions by means of a soft cloth, so that the moisture penetrates uniformly, and the whole becomes firmly adherent to the glass plate. The sheet is then taken away, and the image laid bare.

In the meantime a stone is brought such as lithographers employ, together with printer's ink and litho. ink, which is mixed by means of a little oil varnish. With this ink, applied to a bit of flannel, a roller covered with fine cloth is coated as uniformly as possible; the roller is then carefully and without pressure rolled over the image, which soon becomes black, and rapidly assumes vigour as the rolling goes on, while the whites still remain perfectly white. The picture is then in a position to be transferred to stone; the application of the ink to the image must not be carried too far.

While the paper is yet damp (so that the paste may adhere to the stone), it is laid upon a lithographic stone and passed in this way through the press. If the paper holds too fast to the stone, so that it cannot be detached, a little damping of the paper soon brings this about. The image is then to be seen clear and sharp upon the stone, and the printing off of copies can then be proceeded with in the ordinary manner in any lithographic work-room.

The paper employed in the process for the transfer, being unsized, is easily penetrable by water. Portions, however, of the paper, where the light has acted upon the bichromate of potash covering it, do not become moistened. These parts of the paper, indeed, when heated, will permit any ink to adhere at once.

Unsized paper upon which is formed a print in bichromate of potash, after being heated and moistened with water, behaves, in a word, exactly in the same manner as a lithographic stone; some portions of it attract the ink, while others repel it. Where the light has acted, there the surface becomes hard, and the ink adheres; whereas the other portions absorb water, and in this condition repel the ink.

If the paper is covered on the image surface with starch, the transfer will have more solidity.

COLLOTYPE PRINTING.

A CORRESPONDENT sends us the following:—

"One of your articles in last week's issue, while notifying the fact of the illustration of a magazine with a Woodbury portrait as a proof of a new advance in mechanical photographic printing, appeared to lament as a fact the absence of outward and visible signs of progress in the Collotype or fatty ink process. Collotype, it was said, had proven, by numerous perfect specimens, its potential ability in photographic printing; but as a real active factor in the multiplication of sun prints it was hinted to be 'no where' in the running, in consequence of the immense difficulties—chemical, lithographic, &c.—which beset the process.

"That the difficulties have been real enough there can be

no doubt; but that, to a very large extent, they have been surmounted has been incontestably proved to the writer. The fact is that, while Collotype is making a distinct and lasting impression in the field of literary illustration, its employment has been in channels that do not come under the notice of the ordinary reader, and is distinct from the usual work of the professional photographer.

"I recently had the pleasure of inspecting the Collotype department of the Autotype works, and, by the courtesy of the director, had not merely an opportunity of observing the details of the printing, but of carefully examining the quality and character of the work which was steadily issuing from seventeen out of the twenty vertical presses at present worked at Ealing Dene. I had the advantage of special introduction to the proprietors, contemplated an arrangement to introduce the process into an important colony, and received, probably, a special amount of attention.

"I may say that I was fairly astonished at the nature of the work being done; it was so much more special and second-rate than I had expected, and although evidently a sound commercial enterprise for an empire like the British, I felt it not likely to answer my purpose at the Antipodes. Three of the largest presses (the matrix plates being inked up and manipulated by women) were devoted to the production of copies of ancient charters for the trustees of the British Museum; and although impressions on demy were yielded at a comparatively slow rate (only ten or twelve per hour) yet the result of the deliberate care was a series of admirable, uniform, perfect prints that reproduced M.S.S., stains, time marks, and texture of the original, whether parchment or papyrus, in a wonderful manner. I have since seen some of these Autotype copies under glass at the British Museum for the benefit of the public, and ascertained that the institution issues editions of five hundred and upwards, strongly bound, at less than cost price, for the benefit of museums in general and the pundits in particular.

"Another press was engaged on somewhat similar work for the Palæographical Society, which issues quarterly to its three hundred and fifty subscribers a fasciculus of some twenty-four examples of the rarest and most interesting parchment writings in existence. I understand that the Palæographical Society is one of the most flourishing of our learned bodies, and that it owes its origination to the fact that photography, by the Collotype process, offered such admirable fac-simile reproductions of ancient M.S.S. as to give to the student at his own table facilities for investigation and comparison obtained before only by personal visits to the museums and libraries of Europe where the originals are preserved.

"Three smaller presses were turning out copies of coins—one for an illustration to the annual report of the Royal Mint, another a series of Asiatic coins for the *Numismatic Chronicle*, and a third for a history of the coins of Cromwell and the Commonwealth. These representations obtained from coins (or, perhaps, casts of the coins) were simply superb—the revelation of a new art! The boldness of relief and the clearness of detail made the photographic image almost equal in instruction to sight of the coins themselves. I was not surprised, after examining the work that the Company had illustrated—costly books on Greek, Roman, Syracusan, Mahomedan, Scotch, and Swiss coins—that a steady rill of business flowed towards the Collotype process in this line alone.

"There was also in every stage of execution, from the careful preparation of the negative to the storing completed prints, an elaborate series of photographic illustrations of spectrum analysis; and another series of enlargements from microscopic negatives being printed to embellish and enhance the value of a work on the Rocks of Queensland and Australia. Further up the room no less than four presses were at work on a series of fifty-four plates to illustrate a learned work on Fossil Botany. These were copies of elaborate drawings, to which photography alone could do adequate justice. The edition commanded was one thousand

copies of each of the fifty-four plates, and this alone made an item quite 'commercial' in its amount.

"Another large commission in course of active completion for, I imagine, a foreign government, was a series of about sixteen by thirteen photographs of public works, viaducts, lighthouses, railway stations, docks, fortresses, and the like. I saw hundreds of separate illustrations, and evidence enough that a job was in hand mounting up into serious figures. It would be scarcely fair for me to enumerate all the items of work of which I was permitted to take one, but I was struck by the preponderance of scientific and artistic work, and the comparative absence of work from negatives direct from nature. The public works mentioned are, of course, an exception on a large scale; but I saw scarcely any portraits, and but few landscape views. It is questionable if Collotype lends itself to the multiplication of cartes-de-visite, &c., so readily as the Woodbury process, but it was self-evident, not only that Collotype printing has an extensive field of operation, but that it has taken possession of that field to a great extent. I found a numerous staff, some forty persons in this department alone, and their weekly wages would scarcely continue if the depreciatory estimate of this branch of the black art were the true one.

"I gathered clearly into my mind during the visit that the commercial success of Collotype depended mainly on the ability of the staff to cope with chemical and mechanical difficulties as they arise, and to give to every detail of the process an intelligent and scrupulous care."

UNDRAPED INNOCENTS.*

ALONGSIDE the photographs of persons known to fame, as arrayed in the stores where such portraits are sold, may be seen the picture of a nude, pretty little child, probably about two years old. Its chubby body is represented lying on a cloth, the folds of which cover it to a slight extent. The picture is an attractive one; the infancy of the child being a bar to any idea of indecency, and women admire and buy it extensively. The photographer who put it on the market said, when asked who the child was: "Oh! I wouldn't dare to tell you, except as a secret not to be published. The parents brought her—it's a little girl—to be photographed in that way, and when the picture was made I saw at once that it was pretty enough to sell in the market. So I asked permission to duplicate it. At first the mother refused, but at last she consented, on my promise not to divulge the identity. The truth is she was proud of her offspring's beauty, and hankered after the admiration that the picture would excite. I am selling copies by the thousand, for I am supplying dealers throughout the whole country. All parents, however, could not be brought to consent. I know a photographer who sold pictures of a little son of a gentleman of Newark, and he threatened a lawsuit in consequence. Another case was that of the President of a Life Insurance Company. He had a wonderfully beautiful daughter, about four years old, whose picture was taken by a New York photographer, and a really attractive picture it made. The photographer duplicated it for the trade. Those who have paid much attention to photographs in the stores will remember it—a plump, round-eyed child, coquettishly dressed, and sitting with negligent grace on a sofa, with one of her dimpled legs hanging down. This picture was selling fast, when the father learned about it, and forbade any further sale. All that could be got were called in from the stores. In this case the child was clothed."

"You speak as though pictures of unclothed children are common," said the reporter. "Such is the fact," was the reply; "there seems to be a rage for it just now. Every photographer in the city is doing more or less of such work now-a-days, and very acceptable they find it, I can tell you, in this dull season."

The reporter, in quest of information as to this new

* *New York Mercury.*

feminine freak, called on several of the most fashionable photographers. They all freely acknowledged the surprising extent of the new feature in their business. Naturally, they could see no harm in gratifying a mother's desire to preserve a reminder of her child's infantile charms. Said one:—"I suppose I have made photographs of twenty nude children within a month. It seems to be a wholly new idea, and has suddenly become the rage. These children were from one to four years old, perhaps a little older in one or two instances. Generally the mothers have a settled idea about the pose that they desire, which is often an imitation of some familiar sculptured or painted figure. Cupid is, as might be expected, the model that many expect, and the little ones are made to assume attitudes before the camera such as are given to him in art. I'll show you some of the pictures." Thereupon he took a small album from a drawer, and displayed its contents, consisting of about half a hundred photographs of the kind in question. He said that he kept them as samples, from which patrons might select styles. Cupids abounded, and in several instances statuary was so well imitated in pose that it was hard to believe the original was not marble instead of flesh. Cherubs of various sorts were there, too, and one plump little fellow had wings stuck on his shoulders. A fair, six-year-old girl was posed as Power's "Greek Slave," showing a form as perfect in childish grace as the statue is in womanly beauty. A shapely baby lay in a large shell asleep, and another was kicking up its legs, and flinging its arms as though in high glee.

The chief operator in a leading Broadway establishment said:—"It's the most natural thing in the world for parents to want to preserve in pictures the beauty that is bound to pass away in their children. Why, I have photographed nude the baby of a prominent clergyman, and all my patrons in that peculiar line have been of a cultured, fashionable class." This operator said he had an engagement to photograph four children in a group, and he believed that some painting was to be imitated in the poses. Indeed, it was a peculiarity of this business that the mothers almost always came with a settled conviction of how they wished their darlings to sit or stand. They usually have discovered a likeness between their children's forms and some work of art, and that is enough to decide their choice. He showed the reporter a negative which he had been "touching up," in which a slender, beautifully modelled girl, apparently about five years old, represented Aphrodite rising from the sea. A background had been painted in imitation of a picture that attracted much attention in the Centennial Exhibition, and the figure was graceful enough not to suffer by a recollection of the original. The girl must have been carefully trained both as to her attitude and her expression of face. Indeed, most of the pictures that the reporter saw bore evidence of drilling in the little ones whose forms had been exposed to the camera.

Correspondence.

ALKALINE DEVELOPMENT WITHOUT PYRO-GALLIC ACID FOR DRY PLATES.

Sir,—My plates are eighteen by sixteen; I have a tin dish sufficiently large for the plates, one and a-half inches deep; the inside of the dish has had several coats of white paint, which answers admirably both for developing and washing the plates. In preparing to develop, I pour into the dish as much tap water as will fill the dish to about half an inch deep, then drop into the water about twenty drops of strong liquor ammonia, rock the water about to mix it with the ammonia, then take the plate from the dark slide and place it in the dish, collodion side up, taking

care to flow the water over at one wash, to prevent developing lines. The image will appear immediately. It is as well to rock the dish to cause the water to wash off the preservative at the same time. The same water will develop two or more plates, if used at once. Wash and intensify with acid silver and pyro. If fully exposed, very little intensification will be required. I can easily finish one while the other is left in the water.

REUBEN MITCHELL.

VALUE OF ALCOHOLIC WASHING FOR EMULSION OR PELLICLE.

Sir,—I think you will find that you have in your last issue given credit to the wrong person (Mr. Wratten) for originally discovering the above. I find it was announced (and I believe first) by Colonel Stuart Wortley to the Photographic Society (see PHOTOGRAPHIC NEWS, June 30th, 1876); thus:—"When the pellicle is set in the dish into which it has been poured, it is cut up with a clean slip of glass, and put into a bottle; it is then rapidly rinsed with three or four changes of distilled water, and then with two changes of methylated alcohol, in the latter of which it is allowed to soak for a quarter of an hour. It may then either be taken, and, after blotting off the superfluous moisture, be dried by a gentle heat, or it may be left in a bottle with clean alcohol, which I find to be by far the best method of preserving sensitive gelatine pellicle; and under any circumstances, washings of alcohol are most important, as they extract all the water (this is the point) from the gelatine, and render it far easier to thoroughly dry the pellicle. I also find the diluted alcohol useful in the preparation of the collodion pellicle; but I need hardly point out that in that case it must not be used too strong, or it will cause partial solution."—Yours faithfully,

Junior United Service Club.

HERBERT KERR.

[It will be readily seen, we think, that there is a difference between the two methods and the two aims.—ED.]

Talk in the Studio.

GUM FOR RETOUCHING.—A discussion has been going on in the *Practical Photographer* (St. Louis) on the advantages and disadvantages of a gum surface on negatives for retouching. Amongst the disadvantages is found the fact that cockroaches, being fond of gum, attack the coating, and fail to discriminate between the gum coating and collodion film, eating up all together; the portrait of an emperor or of the most beautiful woman serving merely as a meal for a cockroach.

YELLOW LIGHT.—Mr. Robert Charles Croft writes as follows to the *Daily News* on the above subject:—"It has given me much gratification to find that the humble suggestion I made through your columns respecting 'the application of yellow light as a remedial agent' has met with so much attention, both from the public and from scientific men, although the latter seem disposed to cavil because they cannot at present reconcile their theoretical knowledge of light to the practical use I have suggested. One gentleman under the signature of 'Watson Smith, F.C.S.' is so emphatic upon the matter that I beg permission to say a few words in answer. This correspondent gives me credit for advising yellow light in smallpox, but says that I 'seriously go out of my way' in making other suggestions; that it is a pity I did not try the effect of yellow spectacles (taking it for granted that I did not do so) before I wrote the letter suggesting their use and the use of yellow veils for inflamed eyes and sunburns; and he goes on not only to depreciate yellow light, but to advise your 'lady readers,' before adopting it, to read his elaborate description of the composition of light, and 'to judge for themselves' whether afterwards they will wear blue or yellow. All this is very well, sir, but very little to the purpose. The letter is admirably written, and the description of the spectrum clever enough; indeed, I fancy it is almost too clever to interest the fair readers whom he addresses. Let me in my turn state one or two facts. I am writing this letter in the glaring sunlight, wearing spec-

lenses over which I have placed a piece of deep yellow glass, and I am writing in the greatest comfort, whilst if I remove the yellow glass the glare is too painful to endure. Thus protected I have just been out in the garden and can look up straight at the sun without the least inconvenience. Any one can try this plan (yellow spectacles cannot yet be had), and if it be found that by using some yellow medium we can endure more glare and derive more comfort than we can obtain by any other means, surely it is best to try the practical experiments first and to theorise afterwards. As regards the use of blue spectacles, they relieve for a few moments, but the eyes almost always feel peculiarly uncomfortable after they have been worn for some little time. Perhaps I may be allowed to put the case before your fair readers in a less learned and more familiar manner. Light possesses three properties:—1. Illuminating power; 2. Heating power; 3. Chemical power. You can certainly separate the chemical power from the others, or the photographer's 'occupation would be gone,' for light filtered through a yellow medium, although it retains its illuminating power, loses its chemical properties, and the sensitive plates are not affected. Now what I want ascertained by experiment is this: Can the three properties of light named above be separated or combined and used in any way as agents, to cure disease or to alleviate suffering? I quite believe this to be possible, but as one man can only hope to get together a very small amount of experimental knowledge, I have elected to make public what little I know, in the hope that others will assist in ascertaining any facts connected therewith, and I make this public with less hesitation, seeing that it involves no question of medical treatment, but is an experiment so simple and inexpensive that if there be no ultimate benefit gained, at least no harm will result. The letters I continue to receive relating the temporal effects of yellow light in special cases are encouraging, and I hope the subject will not be lost sight of." Our readers will remember that a correspondent last week gave his experience with a pair of yellow glasses constructed by himself.

RETOUCHING SURFACE.—Mr. C. Ferrie, in the *Practical Photographer*, gives the following:—"Dissolve one ounce of common brown dextrine in sixteen ounces of boiling soft water; then add fifteen grains bichromate of potash; when dissolved, filter, and it is ready for use. Rinse your negative thoroughly from the hypo. fixing solution, and flow with the dextrine; varnish and set away from dust to dry, when it should look as if dried in the usual way without any preparation. If it looks the least glossy, your dextrine solution is too thick and must be reduced. Hand one of these plates to a retoucher, and he will avoid touching it with a pencil for fear of scratching. But there is no danger; it will stand a pretty heavy hand with a XXX Faber pencil, and is capable of taking any shade from the lightest to perfect opacity; and for those who are in favour of needle stippling it leaves nothing to be desired, as it will neither chip or flake off. When you have retouched to your liking, rinse thoroughly under the faucet, dry, and varnish; or, if but few prints are wanted, you need not rinse or varnish."

To Correspondents.

M. Y. F.—If you carefully follow the instructions in any of the articles to which you refer, you can scarcely fail to succeed, but you must be precise in following instructions. The water running irregularly over the face of the Daguerrotype when first applied does at times cause some trouble. When we have found a tendency of this kind, we have applied strong alcohol first, to remove any trace of greasiness which may be present if the plate has been taken from under the glass and fingered; then wash thoroughly with water before applying the cyanide solution. Do not attempt to use a strong solution of cyanide, as if it be too strong it may dissolve and destroy the image.

BAKINER.—You have applied the cyanide fixing solution immediately after development without washing the plate between the operations, and the combination of the iron salt and the cyanide has produced Prussian blue. Remember that you always wash the plate between development and fixing. 2. The image appearing gray all over, and flat looking, may be due to many causes; but most probably, in the case you describe, the defect is due to either over-exposure or over-development. In producing collodion positives the development should be very rapidly done, so as to avoid any deposit on the deep shadows, but for negatives development may be much more deliberate. We prefer backing with maroon velvet; it gives, we think, a richer effect than black varnish.

A. SHORTLAND WRITER.—The primary cause of your imperfect toning is one to which we have very repeatedly of late called attention—the use of a thin poor negative. It is impossible to get rich, vigorous prints from thin, poor negatives. There is not in the deepest shadows of your print a sufficiently deep deposit of silver in printing to receive a rich tone in the gold bath. The negative has apparently been produced in a dull diffused light which has not given a sufficiently marked light and shadow to yield a vigorous image. When the negative lacks intensity and vigour, the lights print through before sufficient silver is reduced in the blacks, and the weak print which is placed in the toning bath only acquires a lavender, a drab or a gray tint, instead of a rich purple-brown or black. The print you enclose is only weak, not unweary. Mediocrity presents a grey-looking granulation. It is generally due to the use of the toning bath too soon after it is mixed. Very long washing before toning makes the toning operation somewhat slower. But whilst prolonged washing is not necessary, the washing must be thorough. The irregular toning of which you speak is probably due to irregular washing previously.

DILKINA.—Judging from the appearance of your print, we should have concluded that the negative had been scratched, and that the chemicals were working very well. We can see nothing in the formula which should not give a good bath. It is rather strong, and we should think not fully iodized. The thin images we should attribute to using a new collodion, as you say you are doing. Use a ripper collodion, and probably matters will improve. As for a formula for a bath, we never find that one made with thirty grains of ordinary crystallized nitrate of silver to each ounce of pure distilled water fails. We generally add from one to two grains of iodide of potassium to each pint of solution. If you have any difficulty, some of the photographic chemists will supply a bath in working order. Mr. Thomas, of Pall Mall, will, for instance. 2. The surroundings to the portraits in question are produced by double printing. We do not think you can buy the negatives for the purpose. As a rule, each photographer designs and photographs his own fancy negatives. Mr. R. G. Payne, of Aylesbury, we believe, supplies a few negatives for ornamental outsize. Possibly he can oblige you.

B. L. A.—It is a moot point whether plain paper prints or albumenized prints are most permanent. Some investigators are disposed to attribute fading chiefly to albumen, but it is quite certain that plain prints do not possess any certain immunity from fading. Developed prints, produced with care, and properly kept, have generally been found to stand well, and have, in most cases, escaped fading. Fading was at one time chiefly attributed to the use of the old hypo and gold toning bath, by which a mixture of gold and sulphur toning was produced, but some toned in this way remain without fading until the present day, having been produced upwards of twenty years ago.

M. Y. S.—If a print be carefully produced—that is, properly fixed with fresh hypo, and then well washed—we think that its permanency is unquestionably made more certain by enamelling or coating with collodion, but if fixation be not properly carried out, sealing the picture up is only sealing up the elements of decay in it. Nevertheless, the general effect of enamelling is, we think, beneficial.

J. HENRY WATKINSON.—Many thanks. The gentleman to whom you refer does, we believe, work the wet process, and your photograph from a collodion plate is unquestionably a finer picture: a powerful argument for the process; but something may be due to the workman!

SLAVE.—Fogging in opal prints may be due to many causes. The same formula and materials which will produce a good negative are not necessarily suitable for opals. The bath may possibly require a little more nitric acid, or the developer may be too strong or insufficiently acid; or the exposure may be too long; or—this is most probable—the development has been too much prolonged.

ONE WHO TRIES.—We have not tried the formula to which you refer. Our experience is antagonistic to the use of acetate of silver in the negative bath. 2. See Mr. Dallmeyer's letter, page 361 of our last issue. 3. A weak solution of iron with citric acid answers the purpose well.

A. LEARNER.—The prints you enclose are not perfectly fixed. The hypo has been old and exhausted, or over weak, or the prints have not been perfectly immersed. 2. We do not quite understand your trouble described as creasing in the background.

F. M. BUTCHER.—Thanks. We shall probably say something on the subject shortly.

RUBEN.—We do not clearly understand what it is you wish to register. Is it the style and mode of grouping? If so, it must be registered under the Design Act. As it has never come within our province to effect such a registration, we cannot direct you with advantage. A patent agent will help you. But we should tell you that a similar mode of grouping in photography has been practiced before.

H. G.—We do not remember the drying box you mention. Several Correspondents in our next.

The Photographic News, August 31, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE PARIS INTERNATIONAL EXHIBITION—POISONING IN THE PHOTOGRAPHIC LABORATORY—THE WARNERKE FILM FOR TRANSPARENCIES.

The Paris International Exhibition.—If North Germany has officially refused to support the Paris International Exhibition for 1878, it is not so with Austro-Hungary. To judge by the names of intending exhibitors which have already been received for Class XII., from Vienna alone, we may expect a very fine show of photography and photographic requisites. No less than half a hundred gentlemen connected with photography, and residing in the South German capital, have signified their intention of forwarding contributions, and other cities of the same State, Trieste, Salzburg, Luiz, &c., will be well represented. In fact, everything seems to augur well for the next French International Exhibition. From France there will be as many as 280 firms represented in the sphere of photography, and, although we cannot state positively the number of British photographers likely to exhibit, we know of several eminent houses who have resolved so to do. Mr. Cunliffe Owen, to whom the whole business, so far as it concerns Great Britain, has been entrusted, has already established himself in Paris with a large staff, all of whom have found plenty to do for some time past. In fact, the circumstance that the Prince of Wales is not an honorary, but working, president of the British Commission proves of itself that the matter, so far as this country is concerned, will be carried out with spirit. The Prince does not shirk his work, but is continually holding business meetings at which he presides, and has more than once visited Paris with a view to furthering the functions of the British Commission in that capital. Notwithstanding, therefore, the gloomy state of things in the East, there is every prospect of Paris presenting next year one of the most brilliant of exhibitions that have ever been held. That a gathering of this kind in Paris is sure to be attractive there is little room for doubt, since everybody is only too glad for an excuse to visit the French capital, while it is more favourably situated than any other spot in Europe. Not only is it adjacent to all the western nations of the Continent, but it is convenient, too, for our cousins on the other side of the water.

Poisoning in the Photographic Laboratory.—At Dusseldorf, the other day, a melancholy accident happened to a photographer, who swallowed some cyanide of potassium by mistake. It appears that he was a travelling photographer, and after a hard day's work wished to take a little brandy from a bottle that was among his utensils. It was dark at the time, and by mistake he took up a bottle containing cyanide of potassium instead, and drank off a draught before he discovered his mistake. The result was almost inevitable. Before aid could come, the virulent poison had done its work, and the man was a corpse. The sad tale carries a stern lesson with it, which those who have a loose way of keeping their poisons will do well to profit by. Almost similar catastrophe happened in our presence in a laboratory in this country not many years ago. In this case a man had some cyanide of potassium solution in a bottle which he kept for cleaning silver. The bottle, to be out of harm's way, was kept locked up in a cupboard, and all went well for a time. But one day the man was given some medicine to take, and this also, after he had swallowed a dose, he put into his cupboard. The next time the poor fellow mistook the bottles; they were in shape both alike, and the liquid therein was not so very different. He poured out a dose and swallowed it, and three minutes afterwards he fell down insensible, with his teeth firmly

clenched. He had been told to take his medicine just before meals, so that the poison acted at once upon the empty stomach. As most people know, the best thing under such circumstances is to swallow an emetic or to take chlorine water or solution of iron, but in the case we speak of, unfortunately, none of these remedies could be supplied with sufficient promptness. Within a quarter of an hour of the event, a stomach-pump was forthcoming, the best thing to use in all such cases, but the man's jaws were so firmly closed that some time elapsed before they could be opened. In the meantime the man was a corpse, and all worldly aid was without avail. One thing these accidents teach us, which should not be lost sight of: it is, that no poison should be contained in a bottle of the ordinary shape and form. Labels are of little use, for in the Dusseldorf instance the man took up the bottle in the dark. But, as everybody knows, there are such things as poison bottles made, different in shape to ordinary vessels, and of these all who have to deal with poisons should keep a stock. If a photographer employs cyanide of potassium daily for fixing, as we presume was the case with the Dusseldorf photographer, he could always manage to secure it in a differently shaped bottle to others in his laboratory; and furnished, moreover, with a label with the word "poison" on it, there should be little risk of accident in the dark or light. "Familiarity breeds contempt," unfortunately, and the consequence is, that having to do every day in his life with poisons more or less virulent, the photographer looks upon them much in the same way as he does his bread and butter. Many, we know, have given up the use of cyanide almost completely, but, nevertheless, it is difficult to do without it altogether, in one operation or the other. On the other hand, in many studios this acute poison is very loosely looked after, and, we fear, is frequently left where ignorant fingers can touch it. So dangerous and rapid is its action when taken internally, that, as we have seen, there is little hope for the sufferer, and it is a mistake to suppose that only in the event of swallowing the compound its workings are deadly. It is not so long ago that we announced in these columns the death of an individual who employed cyanide of potassium for cleaning his fingers, and who had rubbed some of the salt into an abrasion of the skin. Such a case may be rare, but the partial paralysis of the hand and fingers from rubbing cyanide upon the skin is by no means so. We earnestly conjure our readers, and especially amateurs, who are given to the use of cyanide, to take proper care of this terrible agent, and whenever a solution of it is prepared for ordinary use, to put it into a vessel at once distinguishable from those in ordinary employment.

The Warnerke Film for Transparencies.—It is a well-known axiom in dry-plate photography that you cannot over-expose. If twenty seconds will give you a picture, so will forty and sixty, if you will only use a development suitable for the occasion. One instance has recently come under our notice which affords at a glance how far, indeed, one may expose without injury. Mr. Woodbury, whose charming and delicate transparencies are very generally known, recently found that some carbon tissue he had by him failed, in a measure, to give such a result as he desired, and he thereupon essayed some emulsion tissue of Mr. Warnerke for the purpose. The tissue was put into a printing frame upon a negative, and exposed in this way to direct light. Instead of doing this for but a second or two, which would certainly have sufficed, Mr. Woodbury permitted an exposure of one minute and a-half, and then forwarded the film to Mr. Warnerke for development. The images by this time were as plainly marked upon the tissue as if they were albumenized prints, but by careful development they yielded transparencies of a delicacy and vigour not to be surpassed. In a word, we may frankly say that we have never seen better transparent positives than this over-exposed tissue in the end yielded.

PHOTOGRAPHING STATUARY IN AN EXHIBITION.

Mr. JOHN L. GIBSON, manager of the photographic operations in the late Philadelphia Exhibition, in some "Rambling Remarks," describes in our Philadelphia contemporary, some experiences with statuary. He says:—

"There might be quite a good sized volume written in regard to the photographing of those marbles. Now that it is all over, I have my own little secret laugh at my comical experiences. To give a partial explanation—for I won't give the whole of it—I will say that certain parties, generally Italians, calling themselves either artists or agents, had the care of these figures.

"They made arrangements with the 'Company' for the production and sale of photographs of attractive subjects.

"Some of the aforesaid 'artists and agents' had desirable models, others did not. Naturally, jealousies soon came into birth, and those who had little to represent them, or may be, more properly, who had, began to give us trouble, and seriously impede our workings. This opposition was carried to such an extent that toward the closing of the Exposition we were not allowed to work in the art galleries after half-past eight o'clock a.m. Now, gentlemen, those of you who are disposed to do so, and who most certainly do indulge in the habit of criticism, bear this fact in mind. Messrs. Wilson and Adams paid large amounts of money for the privilege of making pictures of some desirable figures. The commissions were, of course, transferred to us who operated. There was no opportunity to move those heavy stones from place to place, and having to work almost at the dawn of day, there was surely not much chance to choose the light. If people—those who pick up a picture, and give it sometimes an adverse criticism—were to know anything of the difficulties under which it had been made, they would be, at least, more lenient in their expressions. Many are the wordy fights that I have had with those 'Sons of fair Italy.' A disinterested American or English observer would have supposed on some occasions that assassination was imminent. I know the character of the people much better. 'Bluster and gesticulation' are sufficiently expressive terms to give character to their actions.

"If you feel at all like myself, you will excuse the inclination I evince to get out of the hard-trodden path of photographic literature.

"Formulæ are being constantly printed and reprinted that are as old as the art itself. Reports of scientific investigations about peculiar properties of rays of light and certain characteristics of subtle chemical compounds (never used by the average photographer) consume as much space as I demand for my R's.

"Picking up my third R, and resuming, I must tell you of our method of varnishing and preparing negatives for printing purposes.

"Since our time for operating upon the statues was reduced to such a minimum, and since we required so many negatives of some of them, we used to put all of our available force at the work, and during a clear morning, an outsider, dropping into one of the art galleries, might have been excused for supposing it to be a photographic stock depot. There were certainly, on many occasions, more instruments than there were models. It was often the case that five cameras would be pointing towards the one subject. As some of these would have four lenses glaring from their fronts, you can readily imagine that a good many negatives were made, even although the circumstances were adverse. It was no unusual sight to see twenty or more instruments being worked simultaneously in one apartment.

"It seems to have become the favoured style to have photographs of statuary prepared with an intensely black background. That I, myself, do not give sanction to it is of very little consequence. I was obliged to accept the idea and aid in its practical production.

"At first, when there was plenty of time, and when one

was allowed the privilege of a full day's work, it was the custom to erect temporary backgrounds, or screens made of very heavy, very dark-green baize. The contrast between the whites of the marble and the heavy colour of the drapery were sufficiently great to give a transparent film in the rear of the figure.

"When we had to rush matters, pop away with all the instruments in our possession, it became impracticable to put up these backgrounds. It would have required as extensive a supply of material as any of the cycloramas demand. Other methods had to be adopted. The most efficacious was to scratch away the background, leaving a bare glass surface, before varnishing the negative. To do this, a considerable amount of care, and some skill as well, is required in following around the outlines of the subject. The major portion can be quite readily removed with a piece of chamois skin moistened with alcohol and ether, or even with alcohol only.

"I originated a style of picture adapted to the reproduction of statuary, the making of which I am sorry to see has not been more vigorously prosecuted. The invention consisted in printing upon the finished albumen print a lithographic background. My design was to secure, or rather retain, all of the delicacy of the silver impression, and then to enhance its value by the contrast of either a flat, or, as the artist terms it, a dead surface, or otherwise an imitation of drapery in subdued colours. Even a flat, gold, silvered, or bronzed relief could be obtained.

"The process is only suitable for such establishments as that of the 'Centennial Photographic Company's,' where immense amount of prints from each negative are made.

"To consummate it, a good deal of detail has to be entered into. No matter how closely they resemble each other, the prints from different negatives have to be kept scrupulously separated. Then again they have to be printed with registered marks, in order to guide the lithographer in his work. One other drawback, I acknowledge, is the tendency of albumen paper to either expand or contract in the most unexpected manner. (One never knows, in the case of a large picture, whether a face will be made an eighth, aye, even a quarter, of an inch longer or broader than he intended it to be. At the last meeting of the members of the National Photographic Association, Mr. W. Curtis Taylor gave quite an interesting discourse upon this subject, and his remarks were responded to by a desultory discussion. As I remember it, the only conclusion arrived at was that sometimes paper would contract, and at others it would expand, and that generally it would do so in directions contrary to your desires. The whole argument was closed by laying the interesting specimens with which he illustrated his lecture (photographs of Dom Pedro) and the discussion generally, in parliamentary phrase, 'upon the table.' The only practical part of the whole affair consisted in the leaving of the pictures to the disposal of the Association.

"Resuming again (I am fond of the letter R.), I will remark that this pet style of picture, which I most certainly claim to be an origination of my own, has been basely imitated. Passing along our leading street in this Quaker town, and adhering to the custom which I acquired in childhood, of looking into every window that contained a picture, I discovered a good many representations of all kinds of differently proportioned Venuses, Apollos, Cupids, and Psyches, that were gotten up or about the same principle. In these instances, however, the picture itself—that is, of the statue—had been carefully cut out from its surroundings, probably with scissors, may be with a 'Robinson Trimmer,' and pasted upon a black or chocolate-coloured cardboard. Although furiously indignant (?) at such an innovation upon that which I claimed to have been an original design, I will acknowledge the effects to be good.

"It is in place here to advert to some pictures that the most of you must have seen, because they were on exhibition in Photographic Hall during the Centennial season. They were also copies of marble and plaster work, mostly of

baso-relieves. I believe that the manner of their production has become the origin of another patent. Looking them over I found that the photograph of a statue was carefully cut out and sealed to a glass. Then the plate was silvered in such a way as to represent a mirror. Putting the affair into the plainest words that I can use, the result seemed to be the combination of a photograph and looking-glass. I liked them so well that I was about to commence making them when I was deterred by that terrible warning against 'infringement.'

"Let us drop the talk about the marbles, or rather the statuary, get back into the orthodox recitation of photographic processes, and consider the varnishing of the negatives. There was a cosy little room dedicated to the purpose. It was surrounded by shelves, and upon these the plates were first placed when brought into the establishment. In one corner there was a veritable closet—no other term would describe the contrivance. It also had shelves. They were made, though, of wire. A gas-stove was placed at the bottom of the cupboard, and when lighted, the heat from it would very soon work its way through the partitions, and speedily dry anything placed upon them.

"Once dry, the negatives had to be varnished; and now commences the resumé of many a trouble.

"Every make of varnish was experimented with. I remember reading at various times during a period of some years, in the English journals devoted to photography, the laments of operators who constantly spoiled their negatives in the varnishing process.

"Lately, since I have been again established in business, I have had instances of valuable plates being destroyed by impure coatings.

"My preferences incline me to the use of a composition made almost exclusively with alcohol and gum sandarac. A small addition of oil of lavender does no harm. I am not convinced that it does further good than to change the smell of the other composition. Castor oil is claimed to be a valuable ingredient, but I acknowledge that I have not made sufficient experiments upon which to found an opinion.

"Without in any way deprecating the manufactured article furnished by the stock houses, I must say that our preferences finally induced the use of a varnish prepared by Mr. Hopkins. I believe that he intended to introduce it to the trade as a staple article, so I have not presumed to ask him for its composition.

"If the varnish is good, I don't know that anything especially can be said in regard to the manner of using it. Experience alone teaches one how to handle a plate, and the workman is no workman after all who depends upon his success on the following up of printed instructions. It is impossible to flow a plate well that is too hot; it is equally impracticable to coat one that is too cold. You cannot very conveniently gauge the condition of a negative by any thermometrical instrument. You must depend upon your fingers, your sense of touch, as your guide. As I have already intimated, practice and experience are the only rules by which to work.

"Sometimes it is advisable, even necessary, to remove a preliminary coating of varnish, and to apply a second. This operation also necessitates a little care, as does everything in connection with the photographic business. A good many methods have been suggested, but I know of none more speedy than to flow the plate with alcohol containing what you might term an impregnation of cyanide of potassium.

"In doing anything of this kind you have to keep a sharp look-out. I have seen exceptional instances of collodion films having been destroyed and washed away from the plates before a stream of water could counteract the influence of the agents used for cleansing purposes.

"The defective varnishing of a negative will create an immense deal of after-trouble. If the fluid is not smoothly flowed, the lines occasioned by its irregularity in drying will most certainly show upon the print. If the plate is heated

over a spirit-lamp, and, through inadvertence, a little conflagration takes place, then spots and blemishes are bound to be the almost irremediable results.

"Adverting again more exclusively to the doings of 'the Company,' I must state that one young gentleman had his time almost exclusively occupied by this varnishing of negatives.

"Some days each one of us who operated would bring in several box-loads. As there were a number of squads of active workers the aggregated accumulation would occasionally be appalling—at least to any one who desired to make early hours. You must remember that negatives were not 'turned over' until almost dusk, and it would never do to allow the work of one day to lay over for completion to the next.

"Assuming that the negative had been successfully varnished, and thus secured from chances of ordinary accident, it still remained for more to be done to it, previous to its consignment to the printing department.

"Our ordinary term for this next operation was 'the shaping.' Retouching was in but little demand, since the major part of the work was of landscape subjects, and the negatives were required to be sufficiently perfect to dispense with it.

"The 'shaping' was a matter of sufficient importance to justify me in making it the basis of another article."

SOME FORMULÆ.

An intelligent correspondent of the *St. Louis Practical Photographer*, writing under the signature of "Little Carbon," gives some details of formulæ worth reproducing. He commences by condemning the use of strong toning baths. He says:—

"In your Bureau of Information, page 227, is a German formula, in which the toning bath contains half a grain of chloride of gold to each fluid ounce. I would characterize this as a horrible bath. If the German artists use such a toning bath as this, it is no wonder they asked H. Roeder, of Chicago, for his formulæ. According to my experience, it would tone so fast that it would take half a day to tone a fair day's printing, and it would be impossible to produce a batch of prints any way near an even or uniform tone. Why? Simply because it is about eight times as strong as it ought to be, and about twenty times as strong as some of our best printers use. I formerly used one grain of gold to sixteen fluid ounces of bath, and my prints toned so fast I could not manage more than six or eight at a time. When I visited Chicago, in '74, I was surprised and delighted with their brilliant tones. Being known as one of the old fogies from the Daguerrotype times, I was at once admitted behind the scenes, and, to my intense surprise, I found men toning with from fifty to one hundred prints in the bath at once. I looked on in amazement, expecting to see some prints reach the old blue-black tone before they could be got out of such a mass; but no such thing occurred. The reason was the prints required from fifteen to twenty-five or thirty minutes to tone, and the tones were beautifully uniform. I remember when I published the albumen process in '61 to have stated that one grain of gold was sufficient for a sheet of paper. When the Journal was received in Rochester, N. Y., where I then was, the leading operator called on me and swore roundly I was a fool or a liar, he did not know which, because his experience taught him that a sheet of albumen paper required three grains of gold. In 1874 I called on the same artist, now doing a splendid business in Detroit, Mich. I asked how much gold he used now? He replied, that his toner calculated one grain of gold for one hundred card prints, or about one grain to three sheets, as it is usually cut. Try to precipitate nitrate of silver with a strong solution of chloride of sodium, and notice the grossness of the precipitate; next take some of the same silver solution and add a weak solution of chloride, and notice

the result—the precipitate will be fine. Or try to do silver-plating with a strong cyanide solution: the result will be rapid coating, but it will flake off; whereas if the coating is done in a weak bath, it will work slow but sure, and will be as firm as if it were not plated, but solid metal.

"As I do not believe in denouncing any formula without offering what I conceive to be a better, I will here give one that has stood the test of ten years' every-day practice:—

"*Silvering Solution.*—Soft water one ounce, nitrate of silver forty grains; float from thirty seconds to two minutes, according to temperature and the requirements of the particular sample of paper in use; when dry, fume until it prints a rich purple black, slightly bronzing in the deep shadows, say fifteen minutes as an average; wash in four changes of water, no acid, but to the fourth water add sufficient salt to make the prints decidedly red. This salt has a double effect: first, the red colour it gives the print enables the toner to decide at once when the colour he wants is reached; second, and most important, it changes any free nitrate which the washing has left in the prints into chloride, a very important item, because a very little free nitrate will precipitate the gold from the toning bath. Soft water for the first washing is also important; if water containing lime—commonly known as hard water—is used, a scum of chloride of silver is apt to form on the surface, which colours with great rapidity in the toning bath, often leading the novice to suppose his print over-toned, while really scarcely begun. Consequence, when immersed in the soda, it is instantly dissolved, leaving the blue-black print brick-red. I make my own chloride of gold by dissolving 25 grains dentist's waste gold in acid nitric C. P. 60 minims, acid muriatic C. P. 120 minims. This will give a solution of which you know the exact value. Dilute to 12½ ounces with soft water. If the acid does not dissolve all the gold, add more until the gold is entirely taken up, but in diluting keep it to 12½ fluid ounces. This gives a solution containing two grains of gold per ounce. Take of this solution a quarter of a fluid ounce, equal to half a grain gold, soft water 16 ounces; neutralize with a saturated solution of bicarbonate of soda, and use at once. Washing soda will do, but I prefer the bicarbonate. Any required tone can be obtained with this bath, from blue-black to chocolate brown, which is at present a very popular tint. Do not throw away the bath when used, but when next wanted decant the clear liquid, leaving the precipitate in the bottle. Add gold from the stock solution, and neutralize. Fix in hypo one part, water six to eight parts, keep moving for fifteen to twenty minutes, then wash.

"*Development.*—I will also give a developer, not because it is so much better than any other, but because I make it 'different from white folks.' Take a wide-mouthed quart bottle (a fruit jar answers well), make a bag of very coarse muslin (Swiss double is first rate) large enough to hold eight ounces prot. sulph. iron, weigh your iron and put it in the bag; now let the bag into the mouth of the bottle, and with a rubber band fasten it so that the iron will remain just even with the top of the bottle; fill up with soft water, and set it aside while you go on with other business; by-and-by you will find the bag empty, and the iron all gone to the bottom; stir it up and spread the bag over the mouth of the bottle to keep out dust. This is the stock solution, and contains a quarter of an ounce of iron to each fluid ounce. For ordinary use, take—

Stock solution	...	...	4 ounces
Soft water	...	...	12 "
Acetic acid No. 8	...	...	1½ "
Alcohol	...	...	½ ounce.

This gives a developer of twenty-four grains per ounce. For redeveloper take of—

Stock solution	...	...	1 ounce
Citric acid	...	...	½ "
Water	...	...	15 ounces

Grind the citric acid in a mortar with a little water, and add to the iron, then fill up with the rest of the water.

(Of course every photographer knows that a little silver must be added to the re-developer before using.) So water must be used. If hard water is used, the silver of the plate is instantly changed to chloride, and development ceases, giving thin, worthless negatives, where first class negatives might as easily be obtained. With the stock solution I can mix a pint or quart of developer in two minutes—strong or weak as circumstances require. Take a bottle that will hold twenty ounces fluid measure, cut a strip of white paper half an inch wide, and long enough to reach the top, paste this on the side of the bottle, and when dry measure four ounces of water into the bottle, and on the paper mark its surface, repeat and mark at 12, 16, 17, 18, 19, and 20 ounces; varnish this paper with negative or positive varnish, and it will last until the bottle breaks. I never put iron solution into a graduate if I can avoid it, and by this plan I never need to do it.

"*Collodion.*—In regard to collodion, where only a small business is done, I have a plan not new but good, which I have practised almost constantly since 1865; it only needs to be tried to be adopted in every small gallery.

Ether, sulph. con.	...	...	20 ounces
Alcohol 95°	...	...	10 "
Cotton	...	...	200 grains

Put the cotton in the bottle and add the alcohol, shake well, so as to thoroughly wet the cotton, then add the ether. If the cotton is good it will leave no precipitate and will settle perfectly clear. It will keep indefinitely. This I call plain collodion.

Sensitizing Solution.

Alcohol	...	...	10 ounces
Iodide ammonium	...	...	200 grains
Bromide of cadmium	...	...	80 "

Or,

Alcohol	...	...	10 ounces
Iodide ammonium	...	...	150 grains
Iodide cadmium	...	...	60 "
Bromide cadmium	...	...	80 "

Dissolve the iodide and bromide in the alcohol by grinding in a glass mortar, and filter into a tall narrow bottle. This will keep indefinitely. When collodion is wanted, decant three ounces of plain collodion and add one ounce of the sensitizing solution. It will be fit for use immediately—but will be at its best in twenty-four hours. By this plan there is no old collodion standing by. Old red collodion may be renewed by setting a strip of clean scoured zinc into it; in a day or two a precipitate will be formed on the zinc, and the colour will be nearly or quite gone. This makes good ferrotype collodion, but is not so sensitive as new.

DISCOVERY OF OXYGEN IN THE SUN BY PHOTOGRAPHY, AND A NEW THEORY OF THE SOLAR SPECTRUM.

BY PROFESSOR DRAPER.*

I PROPOSE in this preliminary paper to indicate the means by which I have discovered oxygen, and probably nitrogen, in the sun, and also to present a new view of the constitution of the solar spectrum.

Oxygen discloses itself by bright lines or bands in the solar spectrum, and does not give dark absorption lines like the metals. We must therefore change our theory of the solar spectrum, and no longer regard it merely as a continuous spectrum with certain rays absorbed by a layer of ignited metallic vapours, but as having also bright lines and bands superposed on the background of continuous spectrum. Such a conception not only opens the way to the discovery of others of the non-metals, sulphur, phosphorus, selenium, chlorine, bromine, iodine, fluorine,

* Read before the American Philosophical Society, July 30th, 1877. This paper has been pronounced, by able judges, to be the most important contribution to solar physics since Kirchhoff's great discovery. It is just thirty-five years since the author's father, Dr. John W. Draper, read his first paper on Actinism, before the American Philosophical Society.—Ed. *Journal of Franklin Institute.*

carbon, &c., but also may account for some of the so-called dark lines, by regarding them as intervals between bright lines.

It must be distinctly understood that in speaking of the solar spectrum here, I do not mean the spectrum of any limited area upon the disc or margin of the sun, but the spectrum of light upon the whole disc. I have not used an image of the sun upon the slit of the spectroscopic, but have employed the beam reflected from the flat mirror of the heliostat without any condenser.

In support of the above assertions the accompanying photograph of the solar spectrum with a comparison spectrum of air, and also with some of the lines of iron and aluminium, is introduced. The photograph itself is absolutely free from handwork or retouching. It is difficult to bring out in a single photograph the best points of these various substances, and I have therefore selected from the collection of original negatives that one which shows the oxygen coincidences most plainly. There are so many variables among the conditions which conspire for the production of a spectrum, that many photographs must be taken to exhaust the best combinations. The pressure of the gas, the strength of the original current, the number of Leyden jars, the separation and nature of the terminal, the number of sparks per minute, and the duration of the interruption in each spark, are examples of the variables.

In the photograph the upper spectrum is that of the sun, and above it are the wave-lengths of some of the lines to serve as reference numbers. The wave-lengths used in this paper have been taken partly from Angstrom and partly from my photograph of the diffraction spectrum published in 1872. The lower spectrum is that of the open air Leyden spark, the terminals being one of iron and the other of aluminium. I have photographed oxygen, nitrogen, hydrogen, and carbonic acid, as well as other gases, in Plücker's tubes, and also in an apparatus in which the pressure could be varied, but for the present illustration the open air spark was, all things considered, best. By other arrangements the nitrogen lines can readily be made as sharp as the oxygen are here, and the iron lines may be increased in number and distinctness. For the metals the electric arc gives the best photographic results, as Lockyer has so well shown; but as my object was only to prove by the iron lines that the spectra had not shifted laterally past one another, those that are here shown at 4325, 4307, 4271, 4063, 4045 suffice. In the original collodion negative many more can be seen. Below the lower spectrum are the symbols for oxygen, nitrogen, iron, and aluminium.

No close observation is needed to demonstrate to even the most casual observer that the oxygen lines are found in the sun as bright lines, while the iron lines have dark representatives. The bright iron line at G (4307), on account of the intentional overlapping of the two spectra, can be seen passing up into the dark absorption line in the sun. At the same time the quadruple oxygen line between 4345 and 4350 coincides exactly with the bright group in the solar spectrum above. This oxygen group alone is almost sufficient to prove the presence of oxygen in the sun, for not only does each of the four components have a representative in the solar spectrum, but the relative strength and the general aspect of the lines in each case are similar. I do not think that in comparisons of the spectra of the elements and sun, enough stress has been laid on the general appearance of lines apart from their mere position; in photographic representations this point is very prominent. The fine double line at 4319, 4317 is plainly represented in the sun. Again there is a remarkable coincidence in the double line at 4190, 4184. The line at 4133 is very distinctly marked. The strongest oxygen line is the triple one at 4076, 4072, 4069, and here again a fine coincidence is seen, though the air spectrum seems proportionately stronger than the solar. But it must be remembered that the solar spectrum has

suffered from the transmission through our atmosphere and this effect is plainest in the absorption at the ultra-violet and violet regions of the spectrum. From some experiments I made in the summer of 1873 it appeared that this local absorption is so great when a maximum thickness of air intervenes, that the exposure necessary to obtain the ultra-violet spectrum at sunset was two hundred times as long as at midday. I was at that time seeking for atmospheric lines above H like those at the red end of the spectrum, but it turned out that the absorptive action at the more refrangible end is a progressive enfeebling as if a wedge of neutral tinted glass were being drawn lengthwise along the spectrum towards the less refrangible end.

I shall not attempt at this time to give a complete list of the oxygen lines with their wave lengths accurately determined, and it will be noticed that some lines in the air spectrum which have bright analogues in the sun are not marked with the symbol of oxygen. This is because there has not yet been an opportunity to make the necessary detailed comparisons. In order to be certain that a line belongs to oxygen, I have compared, under various pressures, the spectra of air, oxygen, nitrogen, carbonic acid, carburated hydrogen, hydrogen, and cyanogen. Where these gases were in Plücker's tubes a double series of photographs has been needed, one set taken with, and the other without, Leyden jars.

As to the spectrum of nitrogen and the existence of this element in the sun, there is not yet certainty. Nevertheless, even by comparing the diffused nitrogen lines of this particular photograph, in which nitrogen has been sacrificed to get the best effect for oxygen, the character of the evidence appears. The triple band between 4240, 4227, if traced upward into the sun has approximate representatives. Again at 4041 the same thing is seen, the solar bright line being especially marked. In another photograph the heavy line at 3995, which in this picture is opposite an insufficiently exposed part of the solar spectrum, shows a comparison band in the sun.

The reason I did not use air in an exhausted Plücker's tube for the production of a photograph to illustrate this paper, and thus get both oxygen and nitrogen lines well defined at the same time, was partly because a brighter light can be obtained with the open air spark, on account of the stronger current that can be used. This permits the slit to be more closed, and of course gives a sharper picture. Besides, the open air spark enabled me to employ an iron terminal, and thus avoid any error arising from accidental displacement of the reference spectrum. In Plücker's tubes with a Leyden spark the nitrogen lines are as plain as those of oxygen here. As far as I have seen, oxygen does not exhibit the change in the character of its lines that is so remarkable in hydrogen under the influence of pressure as shown by Frankland and Lockyer.

The bright lines of oxygen in the spectrum of the solar disc have not been hitherto perceived, probably from the fact that in eye observation bright lines on a less bright background do not make the impression on the mind that dark lines do. When attention is called to their presence they are readily enough seen, even without the aid of a reference spectrum. The photograph, however, brings them into a greater prominence. From purely theoretical considerations derived from terrestrial chemistry and the nebular hypothesis, the presence of oxygen in the sun might have been strongly suspected, for this element is currently stated to form eight-ninths of the water of the globe, one-third of the crust of the earth, and one-fifth of the air, and should therefore probably be a large constituent of every member of the solar system. On the other hand, the discovery of oxygen, and probably other non-metals, in the sun gives increased strength to the nebular hypothesis, because to many persons the absence of this important group has presented a considerable difficulty.

(To be continued.)

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Mr. James Paris, of Ripon, Wisconsin, describes his operations in producing the illustration. He says:—

"In making the negatives for our picture, 'Farewell,' I used a dark woollen background, which left the background in the negative nearly clear glass; and, for the side of the boat, I used the back of one of our side slips, and lined it off with black crayon to imitate the siding, and nailed a narrow strip on the edge to hide the ragged edge of the cloth and give it a more finished look.

"In the first place, you want a good transparent positive to make the negative from. The one I used was made with some of Newton's emulsion; that I made June 18, 1876, with an exposure of about 40 or 50 seconds, and developed with his new developer, described in the *Bulletin* for February 1877, page 57. It came up as quick as a bath plate. I used no preservative—just flowed with emulsion and washed under the tap till smooth, and exposed. They come as near the tone of the Levy slides as any I have seen, and nearly as fine. It is a view on Green Lake, about six miles from here. It was then placed in a front made to fit a Victoria box, with a hole cut in it to fit the positive, then placed opposite the side light, with the ground glass to the light and the bellows nearly drawn out. Then a cone, holding a half-size Voigtlander tube, was put on an eight by ten box and the image focussed sharply the right size and in the

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MEASUREMENT OF HEIGHT OF CLOUDS.

BY A. MALLOCK.*

If the clouds remained practically stationary for any time, and with their contours unaltered, there would be no difficulty in measuring their height, for if such were the case the observers might agree to measure the altitude and position of some prominent feature in a cloud at the ends of a measured base, which would of course give the necessary data; but in general the clouds not only move too fast for this to be done, but their contours, partly from the effect of perspective and partly from other alterations, change rapidly also, so that what perhaps was at one moment a well-marked feature, may in five minutes become unrecognisable.

The observations, then, by which the heights of clouds are to be measured must first of all be simultaneous, and they ought to be made on as many points as possible to obviate the unavoidable uncertainty as to the actual identity of the points observed at each station.

To secure these objects I had recourse to photography, and the way in which the photographs were taken and analyzed I will now describe. A pair of cameras, of one of which fig. 1 is a section, were placed one at each end of a measured base-line, and the lenses pointed to the zenith by means of the levelling screws A A.

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The dark slide (B) fits as a drawer below, and consists of a shallow box, the lid being opened after it is placed in position by means of the milled head (C). Simultaneous

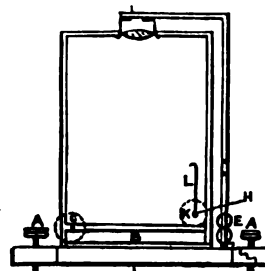


Fig. 1.

exposure of the sensitive plates is insured by uncovering the lens by an electric magnet apparatus (E), both cameras being in one circuit.

After a photograph is taken it is necessary to know the exact position which the plate occupied with reference to the lens; and as it would be impossible—or, at least, very inconvenient—to be obliged to have all the plates and fittings of the slide made with sufficient accuracy to attain this knowledge, I have made use of an easier, and, at the same time, a more efficient plan.

H is a horizontal axis, fixed in one side of the camera, movable from the outside by the milled head (K). On this axis, in the same plane, and terminated in sharp points, are two arms (L), which, in their ordinary position, lie back flat and upright against the side of the camera; but after the photograph has been taken, and before the dark slide has been touched, the head (K) is turned so that points descend on the plate, and puncture the film in two places. As the axis (H) is fixed in the camera, and, therefore, fixed as regards the lens, the two punctures left on the film leave a trustworthy record of the position of the plate at the time of exposure.

The constants, which must be known for each camera before the photographs can be analysed, are:—

1. f , the distance of the optical centre of the lens from the plate.
2. The co-ordinates, x' and y' , of that point in the plate which corresponds to the zenith, the axis of x passing through to the points marked on the film, one of them being the origin.

To obtain these co-ordinates I photograph a target (fig. 2) placed in the zenith at such a distance from the camera

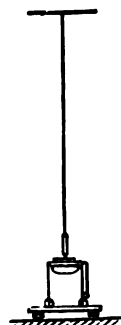


Fig. 2.

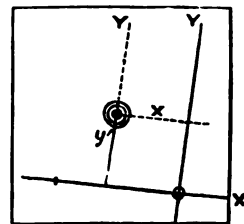


Fig. 3.

that a well defined picture may be taken without altering the adjustment of the lens. A plumb-line passes through the centre of the target, and the camera is placed in position by its means. x' and y' (fig. 3) are then the co-ordinates of the centre of the target in the photograph. I may here remark that any small difference between the optical and geometrical centre of the lens, such as is often found to exist, will produce errors of the second order only in the result. A comparison of the actual size of the target with that of the photograph will, of course, give f , but for

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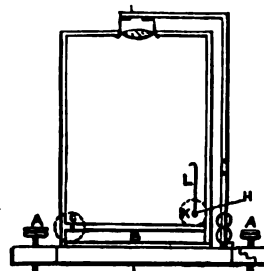


Fig. 1.

exposure of the sensitive plates is insured by uncovering the lens by an electric magnet apparatus (E), both cameras being in one circuit.

After a photograph is taken it is necessary to know the exact position which the plate occupied with reference to the lens; and as it would be impossible—or, at least, very inconvenient—to be obliged to have all the plates and fittings of the slide made with sufficient accuracy to attain this knowledge, I have made use of an easier, and, at the same time, a more efficient plan.

H is a horizontal axis, fixed in one side of the camera, movable from the outside by the milled head (K). On this axis, in the same plane, and terminated in sharp points, are two arms (L), which, in their ordinary position, lie back flat and upright against the side of the camera; but after the photograph has been taken, and before the dark slide has been touched, the head (K) is turned so that points descend on the plate, and puncture the film in two places. As the axis (H) is fixed in the camera, and, therefore, fixed as regards the lens, the two punctures left on the film leave a trustworthy record of the position of the plate at the time of exposure.

The constants, which must be known for each camera before the photographs can be analysed, are:—

1. f , the distance of the optical centre of the lens from the plate.
2. The co-ordinates, x' and y' , of that point in the plate which corresponds to the zenith, the axis of x passing through to the points marked on the film, one of them being the origin.

To obtain these co-ordinates I photograph a target (fig. 2) placed in the zenith at such a distance from the camera



Fig. 2.

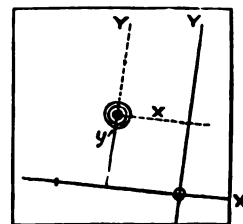


Fig. 3.

that a well defined picture may be taken without altering the adjustment of the lens. A plumb-line passes through the centre of the target, and the camera is placed in position by its means. x' and y' (fig. 3) are then the co-ordinates of the centre of the target in the photograph. I may here remark that any small difference between the optical and geometrical centre of the lens, such as is often found to exist, will produce errors of the second order only in the result. A comparison of the actual size of the target with that of the photograph will, of course, give f , but for

greater certainty I measured f also by taking another photograph with the camera displaced horizontally by a known amount from its first position immediately under the target.

Having got these constants, the analysis of any pair of photographs is very easy. What has to be found is the tangent of the parallax which the cloud would have if it were immediately over one of the cameras, which may be expressed in this case as the difference of the projections on the line joining the two cameras of the distance of corresponding points in the photographs. [The author then described the trigonometrical method of calculating the parallax, and finally showed that $h = p \cdot L$, whence $h =$ height of the cloud, $L =$ length of the base, $p = \frac{d}{f}$, d being the difference of the measured points in the photographic paper, and f the focal length of the lens.]

It will be noticed that it is not the distance of the cloud from the camera, but its perpendicular distance from the earth, and this due to the fact of the plate being horizontal, that is concentric with the surface of the earth. What is really measured is the distance of the cloud from the plane of the plate, so that had any other direction than the vertical been given to the camera—which, of course, might be done—another factor, the same nearly of the angle of elevation of the camera, would appear in the result. There are several advantages, however, in placing the cameras vertically, among which may be mentioned that it is always easy, by means of levels, to ensure a known line in each instrument being vertical; whereas to ensure parallelism in the direction of the cameras in any other case requires an adjustment in azimuth, which becomes more and more important as the direction chosen deviates further from the vertical. The disadvantage of placing the cameras vertical is, that very often the clouds which it may be required to photograph do not show in the **field**.

With regard to the practical part of the analysis, I find that the quickest and most convenient way of finding d is to place the negatives side by side in a frame fitted with a reflector, and with a fine needle to mark a number of corresponding points in each picture; the co-ordinates of these points are then measured by a micrometer, and the points so found, together with the zenith points, are plotted to an enlarged scale, one set of measures being plotted on tracing paper. The tracing is then applied to the other drawing, so that the corresponding points in each may fit as well as possible. The distance between the zenith point in the tracing and drawing $= d$, and the line through them is the direction of the line joining the two cameras. I find it quicker to arrive at the direction of the base-line by drawing than by calculation, while at the same time the drawings give greater facility for distributing the errors advantageously. As to the length of the base-line to be employed, I should say that the shorter it is in reason the better. That which I used was about two hundred yards. Undoubtedly the shorter it is the more convenient, and also, as clouds are often very thick, their contours may, if the base be long, be so different, according as to whether they are seen from one end or the other, as to make the photograph practically useless.

The results obtained are, I have reason to believe, accurate within five per cent., which is quite near enough for all practical purposes. This refers principally to measures of high clouds. Rain clouds were found as high as 4,000 feet. Cumulus was seldom lower than 6,000 or more than 8,000 feet; cirro-cumulus up to 20,000, and cirrus to 28,000 and 30,000 feet. Isolated measures like these cannot, of course, lead to much; but if this method was used systematically at observatories, much interesting information might, no doubt, be obtained about the formation of cirrus clouds, and also about the winds in the higher strata of the atmosphere.

SILVER MUD.

In Wasco county, Oregon, there is a flat, thickly studded with springs of a peculiar character, that throw out mud which has overflowed a considerable area. Some months ago it was reported that this mud had been discovered to be argentiferous and very rich, some specimens amounting over \$2,000 to the ton. An effort was made to organize a company in this city to work the mud springs, but the enterprise collapsed in consequence of a suspicion raised that the mud had been "salted," and the memorable Arizona diamond field swindle was too fresh in recollection for the successful prosecution of another fraud in the same line. Professor Thomas Price analyzed samples submitted, and reported that he had discovered unmistakable evidence of "salting," the microscope showing filings, crystals, and free gold, which he had no hesitation in declaring had been mixed in with the mud with the manifest design of instituting a great swindle. Professor H. G. Hanks also examined specimens, but while he was inclined to suspect fraud, he was unable to determine positively whether the argentiferous mud was an artificial or natural production. Professor Hanks now intimates that the flow of the Oregon mud springs is in reality heavily impregnated with silver, and this result he announced in a paper read before the California State Geological Society. The existence of springs yielding soft mud charged with free silver, says Professor Hanks, is new to science, and scientific men, both here and at the East, who examined specimens, pronounced them fictitious without hesitation. The specimens latterly examined by Professor Hanks, he says, were very rich, and silver was discovered in a free state. By simple washing the silver could be wholly separated, and when then examined the microscope failed to reveal the source of the precious metal. Had it been filings, a single glance would have sufficed to detect the fact. Had the silver been precipitated from solution by copper it would have been crystallized. An amalgam of silver and mercury would have yielded a sublimate if strongly heated in a glass tube closed at one end. Such an amalgam introduced into the wet mud, and the whole heated sufficiently to have volatilized the mercury, would have left the substance in a hard baked state, which could not again have been reduced to the state in which it reached this city.

From these conclusions, if the silver had been introduced for fraudulent purposes, the substance was very remarkable, from the fact that some process had been employed not easily understood. Professor Hanks finally obtained the address of a gentleman, Richard Hurley, residing in the vicinity of the wonderful springs in Wasco county, and applied to him for information. In reply to Professor Hanks, Mr. Hurley writes: "There is no mistake as to this mud containing silver. I have assayed over 100 samples which contained silver, some as high as \$2,300 to the ton. The samples I obtained from the spring myself. I think the weather has considerably to do with the mud containing silver. I obtain the best results when the weather is warm. Sometimes in one of the larger springs, when the weather is cold, the mud will be of a yellow colour, showing no silver; but when the day is warm, the mud is blackish-blue, at least in places, and rich in silver. The springs seem to work more actively in a warm afternoon. Some of them contain a great deal of acid, the bones of animals that fall into them being dissolved in a few months. There are old wells which assay from \$5 to \$1,200 to the ton. One assay I made from the flat, half a mile from any spring, assayed \$1,200 to the ton. There is a great deal of salt, almost pure, all over the spring flat. There are between 100 and 200 quartz leads discovered, running in two directions close to the spring. I find silver in several of them, all the way from a few dollars to \$100 to the ton. Some of these leads run through the springs, at least they point in that direction. The altitude of this place is between 4,000 and 5,000 feet."

Professor Hanks also refers in his paper to the recent dis-

covery of a peculiar silver-bearing deposit located in South-western Utah. It occurs in the "Maud Mine," six miles from Leeds. Some assays as high as \$700 per ton have been made. Instead of being sandstone, as supposed, Professor Hanks found this deposit to be sedimentary, but closely resembling the Oregon mud. Under the microscope it has all the appearance of that strange substance. The Oregon mud, if allowed to dry in large quantities, would soon form a similar substance to the Utah mineral, in appearance at least. The silver is in the state of chloride, and is seen under the microscope both amorphous and in crystals. An analysis of the two minerals will be interesting, and may throw some new light on the subject. It is possible that a study of these deposits may contribute much to our knowledge of the formation of metalliferous veins.—*San Francisco Examiner*.

ARTISTIC PRINCIPLES AND MECHANICAL OPERATIONS IN PORTRAITURE.

BY G. W. HITE.*

HAVING been frequently called upon to express an opinion relative to the theory of combining artistic principles with the mechanical operation of taking likenesses by the photographic process, I will give you that which I have gleaned from what I think the best authority, together with my own experience.

The room in which the sittings are taken should have but one light, looking northward, because the light continues the same, and is not subject to the changes caused by the passage of the sun in rooms receiving the light from other quarters. An east light is nearly as good, if the room has a window; but if a sky-light, it is influenced by the oblique rays of the sun, till it has passed the meridian. The light should be so high as to fall upon the person sitting; the distance they should be placed, and the consequent angle of light, must be determined by taste, and governed by the capacity or field of the camera, and the character of the party sitting. If a window, the light should be excluded from the lower part, near which the camera stands, to give the fullest and most perfect form to the shadows of the face, which might otherwise be cut up by under-reflections.

Fine developments of the forehead should be placed so that all the ocular forms can be distinctly delineated, in combination with the cast or deep shadows under the brows, which, though richly and strongly marked, must be transparent in the picture, to produce an effect which the reflected light from the upper part of the cheek and surrounding points always introduces. Studying a favorable position for the eyes, and producing a picturesque appearance in the brows, the shadows from the nose and under lip are almost sure to accord.

Delicate features—women and children—require a treatment as delicate; and great attention should be paid to so place them as to preserve it. Enough shadow must, however, be introduced to preserve the roundness, and render expressive every sweet and tender undulation.

The person should sit about three yards from the camera (nearer approach is generally discovered in the picture), the features drooping, &c. The camera standing higher than the subject introduces the same faults, unless the angular position in which the person sits requires an elevation of the camera—so that the lens would be on a parallel line with the sitter. It is well to sit the person so that the face is a little higher than the camera, and place an object at such distance as the eye of the sitter can fairly reach without much motion. In the eyes, great variety presents itself; and it is particularly necessary to observe the iris of the eye—the whole circle being seen in full eyes. In eyes less full the iris passes up under the upper lids, &c. The person should never be set so much sideways as to bring the eyes strained into the corners.

* *Practical Photographer.*

Notwithstanding the stationary character of the nose, it demands great consideration in adjusting the sitter. From various causes the cartilage of the nose is seldom uniform or perpendicular on the face. It must be inspected full-faced, right-and-left, three-quarter, and in profile, to gather from the variations the form which suits with the presiding expression in the combined features. An irregular aquiline nose inspected in a three-quarter view will appear hooked with the one cheek toward you, and inverted on the other, arising from the insertion of the cartilage to the nasal bone projecting unequally on one side, and proceeding in an angular direction towards the tip of the nose. An inequality of size or form in the nostrils will also have an influence on the character of the picture. Hence it is expedient for those who are unacquainted with these causes and effects to examine extreme cases, which, being very apparent, will give a judgment, where the case is only perceptible to the practitioner from its slight deviation from regularity.

So great is the difference in many faces, when inspected in opposite directions, that one of the two views, however accurately taken, would not communicate the likeness—it not being the usually observed characteristic form. When the right view of the head is obtained, it is first necessary to consider the size of the plate it is to be taken on, so as to form an idea of the proportion the head should bear to it. The mind must arrange these points before we commence, or we shall find everything too large or too small for the happy proportion of the picture and the conveying of a just notion of the stature. The work will have to be done over, and time sacrificed, if this is not attended to. The adjustment of the head to the size of the plate (as seen from the margin of the mat) is not to be taught: every one must bring himself, by scrutinizing practice, to mathematical accuracy; for something will be discovered in every face which can be surmounted only by experience.

The eye nearest the camera, in a three-quarter face, is placed in the middle of the breadth of the plate; the chin, in a person of middle stature, in the middle of the length; and higher according to the proportional height of the person.

From tranquility to the smile may be ranked as familiar expressions, unexceptionable for portraits, and not subject to capricious observation. But as there is such a variety of temperaments, we will seldom find persons who can control this most desirable point for a photograph. Much, however, depends upon the associations that are brought about upon the spur of the moment.

In conclusion, I would say to operators generally, that rigid practice renders accuracy habitual, and a pleasure; slovenly operations generate labor and difficulties.

A NEW THEORY OF THE SOLAR SPECTRUM.*

At a time when the nebular hypothesis has formed the groundwork of several papers read at the just concluded meeting of the British Association, news has arrived from America of what promises to be one of the greatest discoveries in solar physics since those of Kirchhoff—a discovery, moreover, which supports the nebular hypothesis by removing one of the difficulties which stood in the way of its general acceptance. If the light of the sun as it passes through a narrow slit is examined by means of a prism a number of dark lines will be seen crossing the spectrum parallel to the line of the slit. Some of these lines are better defined than others, and at a first glance they are seen to be more numerous in some parts of the spectrum than in others. These lines were first discovered by Wollaston, the celebrated English chemist, but they are known as Fraunhofer's lines because they were first accurately mapped by the German optician. Fraunhofer also established the fact that the lines are not due to any interference of our atmosphere, by showing that the lines, when seen in the spectra of

* *The Echo*

the moon and planets, are arranged in exactly the same way as they are in the spectrum of the sun which is the source of light for those reflectors, while the spectra of the fixed stars exhibit not only different groups of lines, but different arrangements. If we examine the spectrum of a gas-flame we find it to be what is termed continuous—that is, it does not exhibit any dark lines, which are in reality due to the absence of rays of the refrangibility due to that part of the spectrum; the light of the gas is simply due to the incandescence of the solid particles of carbon, and with all incandescent substances we have a spectrum unmarked by dark lines. But with bodies in the state of gas or vapour we obtain discontinuous spectra, which are characterised by more or less prominent distinguishing features. Thus, if we volatilise a salt of sodium, such as common salt, and examine the luminous metallic vapour by means of the spectroscope, we find a bright yellow line as the characteristic indication of the presence of the metal sodium, and we find also that this line corresponds to the dark line which is marked as D on the charts of the solar spectrum.

Other metals give peculiar or special bright bands in their spectra, which correspond to dark lines in the solar spectrum, and the question naturally arises, why are the bands dark in the spectrum of the sun if they correspond to the bright bands of the spectra of metallic vapours? This question was answered by Kirchhoff, who propounded a new theory of the sun's constitution. Kirchhoff found that the vapour of burning sodium has the power of absorbing rays of the same refrangibility as those which it emits, and the same is true of other metals. Hence, after making a numerous series of experiments, he concluded that the mass of the sun is an intensely white-hot surface, emitting white light; but it is surrounded by an envelope of vapours of the burning metals, which absorb the rays issuing from the white-hot mass within, just as the vapour of sodium in the lecture-room absorbs those rays of an artificial light which are of the same refrangibility as those which it emits. From Kirchhoff's discovery, then, we know, as well as we can know anything, that the sun contains sodium, calcium, strontium, iron, hydrogen, &c.; but we did not know, until the remarkable discovery recently announced by Professor Henry Draper, M.D., in the United States, that the spectrum of the sun betrayed the presence of oxygen, and probably also of nitrogen. His discovery—corroborated by a photograph of the solar spectrum side by side with that of atmospheric air—shows that oxygen discloses itself by bright lines in the solar spectrum, and does not give dark lines like the metals. The theory of the solar spectrum must, therefore, be corrected; for we can no longer regard it merely as a continuous spectrum, with certain rays absorbed by metallic vapours, but as having bright lines superposed on the background of the continuous spectrum. Professor Draper's discovery, which has yet to be worked out, is of especial importance, for it shows that the non-metals may behave differently to the metals, and that, consequently, there may be many more elements in the sun than has hitherto been supposed; and, as mentioned above, it is one more fact in favour of the nebular hypothesis. On purely theoretical considerations, derived from terrestrial chemistry and the nebular hypothesis, it would seem that oxygen must be present in the sun, besides other non-metals; and this discovery will give renewed impetus to the investigations of spectroscopists. It may appear to those unacquainted with the spectroscope that the practical utility of these discoveries is very small; but, apart from the fact that all knowledge must be useful, the spectroscope is a very valuable instrument in the hands of the analyst, for it enables him to detect the presence of metals in the minutest quantities. To give only one instance of its practical utility, if it were desired to test whether a well is polluted by the leakage of a drain, it would suffice to pour into the latter a quantity of lithia solution—for the metal lithium can be infallibly detected by spectrum analysis—and its presence in the well-water would be positive proof of communication between the drain and the well.

PRICES OF PORTRAITURE IN AMERICA.

Mr. J. CADWALLADER, an Indianapolis photographer, discourses in some of our American contemporaries on the subject of prices. He asks, "Shall prices come down?" and adds:—

"This question is forced upon us by the stringency of the times. For one, I favour holding up prices. If other localities can maintain good prices, I think we can do the same here. The leading galleries throughout the country should set the example, and we of smaller pretensions should try to follow.

"Now let every artist in the country give his views on this vital subject. What are the prices which should prevail? And what prices do you obtain?

"A full expression from the fraternity may give courage and confidence to many. It may enable many of us to adopt a better course to pursue in the future—to know just how the business is managed, and what prices prevail in other sections of the country. Is it expedient, in the present depressed condition of the country, to lower prices? I think not. What say you, gentlemen of the camera? I wish that a thousand artists from every part of the country would give their prices, that we may each see what others are accomplishing. Then, if any of us see that better prices prevail, and the business of the galleries which obtain the better prices is prospered thereby, it may strengthen such as are weak, and stimulate them to obtain better prices.

"In the multitude of counsel there is strength. If, in the judgment of the united fraternity, the exigencies of the times require a reduction in prices, then let us be governed accordingly, and drop on the prices all along the line. But, as before stated, I for one do not think it expedient to lower prices.

"This city has a population of 100,000, and about twenty-five galleries, some of which are very good. L. D. Jenkins is a good photographer and has a good gallery, and gets \$5 for cards, but I regret to say that at another gallery in the city, owned by him, he hangs out a \$2 sign. I believe that no man in the business knows better than does L. D. J. that \$2 is not the best thing.

"Smith and Dryer have recently opened a very nice gallery, all on the second floor, and are getting \$5 for cards, and say they will maintain good prices. Mr. Smith is a new man in the business. Mr. Dryer has been well known as an artist for years, having been one of the Government artists at the transit of Venus.

"D. R. Clark has one of the best galleries in the city; is making cards at \$4, cabinets at \$8. Harry Fowler, well known in this city for years, holds firm at \$5 for cards. J. H. Dunn has just reopened in a new building; \$3 for cards. W. H. Potter has a good gallery; he reduced last winter to 4 for cards. Then there are other galleries; each seems to be vying with the other to get at bottom figures for cards.

"Now if my views in this matter meet those of the fraternity generally, and the Editor, after a few months of interchange of ideas a great amount of good may be done.

"My individual theory is that, amongst galleries which do good work and are kept clean, there should be a uniformity in prices. At least there should be a recognized and established price, below which no artist should feel himself at liberty to go. It is plain that if such were the established rules of the craft, it would be a great benefit to the whole. With a little broader application of this proposition it becomes equally plain that any system which benefits the whole is likewise a benefit to the individuals who compose the whole.

"Therefore, as the beginning of the tally which I have suggested, I offer the following schedule of prices, which now prevail in my gallery, and which have been established during five years:—

Cards, half-dozen	...	...	...	\$3 50
" 1 "	...	...	...	5 00
" duplicate, per dozen...	...	...	...	3 00

Cabinet, 1	...	...	...	3 00
" half-dozen	...	...	...	6 00
" 1	...	...	...	10 00
" duplicate, per dozen	...	...	...	8 00
4 by 4, 1	...	...	...	4 00
4 by 4, duplicate	...	...	...	1 50
8 by 10, 1	...	...	...	6 00
8 by 10 duplicate	...	...	...	2 00
11 by 14, 1	...	...	...	10 00
11 by 14, duplicate	...	...	...	5 00
14 by 17, 1	...	...	...	15 00
14 by 17, duplicate	...	...	...	8 00

Correspondence.

M. ROUSSELON'S CLAIM TO AN ENGRAVING PROCESS.

SIR,—In your issue of August 10th, and under the head of "M. Rousselon's Photo-gravure process," I see that that gentleman has now come forward before the Photographic Society of France as claimant to being the first discoverer of reliefs possessing grain by which photo-engraved plates could be obtained, and that a publication of M. Placet's has been the immediate cause of his bringing forward this, as you justly style it, extraordinary claim. Now, as you are aware, for some years past I have repeatedly challenged M. Rousselon, through the medium of this and other journals, to show in what the manner employed by him differed from the one discovered and put in practice by me in his atelier at Asnières, in the year 1869, and which method I communicated to him at the same time. The articles I allude to were translated into French and other journals, and yet they were never replied to. He says, in his letter to the French Society, "My discovery has already brought me awards from Vienna, Brussels, London, and Paris." But it could not have been a discovery that obtained him these, but certain results obtained in a particular manner. I should hardly think that in France (as I am sure they would not in England) that award would be given for a discovery, unless the recipient of such award proved that he had discovered something, which M. Rousselon has never yet done, and which I now again challenge him to do, and also that he was not materially assisted by me in an improvement of great importance to the success of the process.

I may add that M. Placet's methods of obtaining grain for engraved plates are based on an entirely different principle to mine, though a method lately put forward as invented by M. Despaquis is almost identical with the latter.

WALTER B. WOODBURY.

Dusseldorf, August 10th.

REMOVING NITRATE SALTS FROM GELATINE EMULSION.

SIR,—We observe, in your issue of the 24th August, a letter from Mr. Herbert Kerr, claiming for Colonel Wortley the discovery made and published by Mr. Wratten in your paper of the 17th August. Your appendix to the said article is good; yet, as he seems to have been incapable of perusing the said article with profit to himself, we solicit permission to tell him the gist of the matter, and thus set his mind at ease. We do not, then, pour out the emulsion to "set," nor wash it with water, nor soak it in alcohol for the mere final purpose of extracting the water, as did Colonel Wortley. We add the alcohol direct to the emulsion for the specific purpose of extracting the nitrate salt formed by double decomposition, well knowing that if we extract the water holding it in solution its extraction is a necessary accompaniment. This the grand and all-important point Colonel Wortley seems to fail to comprehend. Need we ask why?—Respectfully yours,

WRATTEN AND WAINWRIGHT.

38, Great Queen Street, Long Acre, W.C.

PHOTOGRAPHY AT THE SEAT OF WAR.

SIR,—I notice Dr. Vogel says in last week's article that it is a difficult matter to get permission to take photographs at the seat of war, either from Russian or Turkish side. I have a special permission from the Turkish Government to photograph in Asia, and since I have returned to England I have an invitation from one of the Pashas to join his staff to take photographs. The only difficulty I ever experienced in going anywhere, or doing anything, was the want of money. I should have done more, and gone further, if this had been supplied to me. I would undertake to reach Chipka Pass in fourteen days after starting from London, and also secure photographs, if the sinews of war were forthcoming.—I am,

ED. POCCOCK.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly summer meeting of this Association was held on Saturday, the 25th instant. At the invitation of the President the members met at his residence, Clare Mount, Wallasey. Unfortunately the weather turned out in every way unfavourable for photography, and, though a walk was taken to the old tower, it was considered useless to expose a single plate. On returning to Clare Mount two attempts were made to obtain on a wet plate a group of the members; but, although exposures of a minute and a-half and three minutes were given, only a faint positive was the result.

The rain coming down heavily, an adjournment was made indoors, where the members proceeded to do justice to the President's hospitality by demonstrating that, however skilled they were in preparing emulsions, they were no less adepts at the tea and coffee process, and were capital hands at cleaning plates.

The President showed a number of negatives and prints taken during his tour in Switzerland and Yorkshire, and afterwards took the members into his dark room, where he gave a demonstration of the manner of preparing gelatine emulsion by Mr. Wratten's method. He coated a number of plates, brought by the members, with gelatine emulsion, and finally took an enlargement by Leach's process, with the aid of the sciopicon.

Mr. W. E. POTTER demonstrated the manner in which he packed his whole-plate camera and double backs on his bicycle, and stated that he found no inconvenience in travelling thus laden. He exhibited a print of a pretty view near Llangollen which had been taken on one of his trips.

Mr. J. H. T. ELLIOTT showed a number of fine prints taken in Wales.

Mr. J. A. FORRESTER exhibited a number of beautiful views, chiefly of the interior of the Town Hall, Manchester, taken by Mr. J. Pollitt on wet collodion plates. Although the exposures varied from two minutes to six hours, all were charmingly soft and full of detail, without any of the blurring so often seen about the windows of interiors. They were doubly interesting to photographers, as each print was marked with the name of the lens by which it was taken, size of stop, and length of exposure.

Mr. W. ROPER, of Lancaster, was elected a member of the Association.

The usual monthly evening meetings will be resumed at the Free Library on the last Thursday in September.

Talk in the Studio.

PHYSIOLOGICAL PHOTOGRAPHS.—At the recent meeting of the British Association, under the title of "Photographs of Representations of Vascular Injections, by Professor Dantscher, of Innsbruck," an abstract of a paper by Professor Allen Thomson was read by one of the secretaries. In this paper Professor Thomson brought under the notice of the section the approaching publication of a series of photographic representations of the "minute distribution of bloodvessels in a number of the organs of the animal body made under the superintendence of Professor Dantscher, of the university of Innsbruck, from injected and corroded preparations made by himself. Dr. Thomson saw some of these preparations some years ago at Innsbruck, and admired them much. The collection had since been much increased, and the photographs executed

partly on paper and partly on glasses, and some of them coloured after the original preparations are capable of being viewed with the stereoscope so as to give a truthful and instructive view of the beautiful structures they represent. Dr. Thomson regretted that accidental circumstances made it impossible for him to show some of the photographs to the section, but it was stated that they would be presented to the meeting of German naturalists at Munich in September.—No discussion took place.

THE RECENT ECLIPSE.—The Rev. C. Fritchard, writing to the *Times* of the late eclipse of the moon, says:—"Before and during the progress of the eclipse many photographs were taken by Mr. Jenkins, with Dr. De La Rue's 13in. reflector, and when these are critically scrutinized it is hoped that some light may be thrown on the extent of the earth's atmosphere, because it may be assumed that, owing to the absorption of actinic rays by our atmosphere, the photographic shadow may extend and be traceable a long way beyond the true penumbra. The exposure of a photographic plate to the telescopic image of the totally eclipsed moon for two minutes produced no effects as yet discernible."

AMERICAN COMPETITION IN MECHANICAL PRINTING.—The *Scientific American* describes the curious competition in the States between two rival photo-mechanical printing establishments. It says:—"A short time since the (U.S.) Treasury advertised for bids for printing bank checks at so much per thousand, and there was so much rivalry between the American Phototype Company and the Graphic Company that each of them determined to get it if possible. The Phototype Company bid for the job at $\frac{1}{4}$ of a mill per thousand, and the Graphic, not to be beaten, offered to do it for nothing, and the contract was awarded to the latter as the lowest bidder. The Phototype Company now appear by counsel before Assistant-Secretary French, and ask that the contract made with the Graphic Company be set aside, on the ground that the bid of the latter was not in accordance with the terms of the advertisement, which called for bids 'at so much per thousand,' and that 'nothing' was not so much per thousand. The Secretary has not given his decision yet, but it is believed he will differ from the learned counsel of the Phototype Company."

PHOTOGRAPHIC CHEMICALS.—The danger attending the handling of chemicals used in the photographic business is greater than many would suppose, and it is a wonder that many more are not seriously injured. Some, in fact, are, but it is not generally known. We are led to these remarks by meeting with a very painful accident, but not serious, since our last issue, from opening an ammonia bottle. The stopper flew out with such force that the ammonia made tracks for our left eye. The only remedy was to make for the water tank, which we did by going it blind. This has caused us to switch off to the right eye for assistance in getting out this number of the journal, and have gone one eye on everything ever since. But we hope by our next to see stereoscopically correct again. Photographers cannot be too careful in handling acids, ammonia, ether, collodions, and other dangerous chemicals in hot weather, for an accident may happen, as it did to us, when least expected.—*Practical Photographer.*

A NEW MUCILAGE.—The *Journal de Pharmacie* states that if, to a strong solution of gum arabic, measuring $\frac{3}{4}$ fluid ounce, a solution of 80 grains of sulphate of aluminum dissolved in $\frac{1}{2}$ of an ounce of water be added, a very strong mucilage is formed, capable of fastening wood together, or of mending porcelain or glass.

To Correspondents.

H. H.—Tungstate of soda is dissolved and added to the solution of chloride of gold, in the same manner as acetate of soda is used. Follow the instructions of the formulae we have given in our *Year-Books*. 2. It entirely depends on the nature of the varnish as to whether you can easily remove it from a negative. If it be a spirit varnish, repeated washes of strong alcohol will remove it. But re-varnishing will often remove the dulness caused by "chilling." 3. Coffee used in dry processes is, of course, roasted. It is the same article which is employed for table use.

L. S.—We do not keep the dates in our memory, and have not the means of reference at hand. Our correspondent should make the search for himself, which he wishes us to make for him. Being from home, our reference books are not at hand.

H. VANDALEUR.—We are always desirous of helping correspondents as far as possible; but they should remember that this column is devoted to answering questions and giving advice on specific difficulties, not to teaching processes or re-stating formulae. It would be simply impossible to instruct you how to take "Ram-breads" in the space we can devote to "Answers." We have published many articles on the subject, both in the *News* and in our *Year-Books*: to these articles we must refer you for general hints. Remember that the principal characteristic of this style of portraiture is a prevalence of shadow or half-shadow. Use a concentrated light—that is, leave very little of your large skylight uncovered by blinds—and bring the sitter close under this concentrated light. Use thin translucent blinds over a great part of the glass, so as to secure half-lights, or effect the same end by the use of hand-screens in the manner we have recently described. In some cases the sitter may face the light with advantage, in others it is undesirable. A dark grey background will answer. 2. The lens you mention will, in many cases, answer well for card groups; but, of course, everything depends on circumstances. If there are many in the groups, a lens of longer focus would be better. A stop will (in groups) often be desirable to secure perfect definition; but it will, of course, increase the exposure. 3. The ordinary negative bath will, in many cases, serve for ferrotypes; but it often requires more nitric acid in a bath for ferrotypes than is desirable in a negative bath. We do not understand what you mean by using "plain collodion" for ferrotypes. A properly prepared positive collodion should be used. 4. We cannot give you any better formulae for a negative bath than those we have often repeated in the *Year-Books*, and to which you refer. Good results are as much dependent on care and skill as on formulae.

F. T. DAY.—The spots have the appearance of those caused by the particles of bronze used in what is termed "gilding" printing on cards. None of the cards sent is printed in gold, but they may have been in contact with cards which have been so printed. We have seen at times almost every print in a portrait album spotted through the presence of two or three with bronze printing. The carbonate is the best form for ammonia in the fixing bath.

D. TOLMAN.—There are various methods of photographing on wood for the engraver. It is difficult to say which is the best method. The use of collodio-chloride of silver, using a very powdery sample of collodion, answers well. Taking a collodion transparency in the ordinary way on glass, toning it with platinum, and then transferring the film, face downward, to the wood, after this, dissolving the collodion, leaving the black platinum image on the wood, also answers well. We do not know where you could obtain lessons.

J. C. B.—The microscopic photographs to which you refer are chiefly produced in France. We cannot tell you where you can procure them.

J. F. NEWLAND.—You wish us to assist you to secure better lighting than you have at present, but you do not send us any example of your present lighting, to enable us to suggest how it may be improved, nor do you say in what method you use your blinds. If you send us fuller information we will do what we can to help you, better than by simply answering your questions regarding Bigelow, whose method, as described, we do not quite follow. The only difference between calico and muslin is, we take it, that the latter is finer, thinner, and more transparent than the calico. We sent off the book as soon as your request to do so reached us.

A. CONTINENTAL SUBSCRIBER.—We shall be glad to hear from time to time of your success.

B. E. F.—Prints whilst toning should receive constant attention, to prevent them from sticking together, or floating to the surface, and so becoming unevenly toned, as the sample enclosed is. Use a pair of horn forceps for lifting them, and take care that the forceps are not used for any other purpose. The same attention is required whilst the prints are fixing.

A. THREE YEARS' SUBSCRIBER.—The simplest process you can adopt, if you are not familiar with the class of work, is to make a collodion enlargement on glass, and transfer it to your canvas, as we have several times described. Having produced and toned your transparency, place it in a large dish containing water to a pint of which twenty grains of citric acid have been added. This will loosen the film from the glass. When loose, pour off the acid water and rinse with clean water. Then lift the plate out of the water, and place a sheet of tissue paper the proper size on the film. Turn the edge of the film just over the edge of the tissue paper, and lift the whole away from the glass. In the meantime, your canvas should be at hand quite ready, and upon it you place the film and paper. Rub down carefully, and then lift the tracing paper away. The canvas should be prepared by cleansing from greasiness by sponging with a little fine soap and warm water, rinsing well, and finally sponging with alcohol. Finally, apply a three-grain solution of gelatine with a broad, flat brush, and allow it to dry. It is then ready to receive the collodion picture as we have described.

Several Correspondents in our next.

The Photographic News, September 7, 1877.**PHOTOGRAPHY IN AND OUT OF THE STUDIO.
THE VELOCITY OF LIGHT—THE PHOTOGRAPHS OF THE LAST
NORTH POLE EXPEDITION.**

The Velocity of Light.—M. Fizeau, whose name as an investigator of light is well known in the photographic world, has been followed up in his researches, it seems, by M. A. Cornu, so far as the determination of its velocity is concerned. M. Fizeau has made the subject of light quite his own, and, in the early days of Daguerrotype, he did much towards improving and elaborating the process. He it was who first of all distinctly comprehended the fact that so long as only one image could be secured by the Daguerrotype process, the application of the latter must be very limited. It was his endeavour, after an image had been once secured, to produce therefrom other duplicate images—a problem which Fox Talbot had already solved in his process, which permitted of the production of negatives instead of positives. Fizeau's Daguerrotype engraving process, by which he sought to convert the Daguerrotype plate into a printing block, from which impressions might be printed in the press, although a singularly ingenious one, turned out of little practical value, since it was impossible to produce half-tones by its means in any degree of perfection; and the strides made at the same time by the application of collodion and glass plates to photography at once placed M. Fizeau far behind, and he abandoned a line of research which, at one time, bade fair to ensure him considerable reward. But he did not forsake the shrine at which he had so long worshipped; he simply devoted himself to some other portion of the vast subject which he had made his own. This was to ascertain the velocity with which light travels, a matter which, as everyone who has studied light knows, is beset with peculiar difficulty. According to M. Fizeau's experiments, the velocity of light was 185,157 miles per second; and when we mention that, after some very elaborate researches undertaken by M. Cornu, this gentleman finds that the velocity is represented more accurately by 185,370 miles per second, we can only wonder at the accuracy with which M. Fizeau conducted his investigation. Unfortunately, in a delicate research like this, it is impossible to exclude errors of all kinds, and we must take, therefore, both the results of M. Fizeau and M. Cornu as approximate truths only; still they are both so near one another that we may, at any rate, conclude that light travels in any case at the extraordinary velocity of more than 185,000 miles per second. We have no such trustworthy data in respect to the velocity with which electricity travels, for in this case the estimates made by various philosophers differ widely from one another. Thus Fizeau estimates the velocity of the electric spark through iron at 62,100 miles per second, and through copper at 111,780 miles; while Wheatstone's results seemed to prove that the velocity was as much as 288,000 miles per second. Kirchhoff, the German philosopher, tells us that the motion of electricity in a wire where it meets with no resistance should be 192,924, which is the same as light *in vacuo*. Photographers may be interested to know how it is possible to determine the rate of travelling of so rapid a medium as light, and we therefore will try to explain the method adopted by M. Cornu in as few words as possible. There is a toothed wheel which revolves at a rapid and known velocity. A powerful ray of light, which may be termed pin-pointed, is allowed to pass through one of the niches in the wheel, and as the wheel revolves the point of light is obscured whenever a tooth passes. We will imagine the wheel at rest for a moment, and this ray of light shining through one of the niches. By having recourse to suitable lenses and a reflecting surface upwards at the proper angle, this ray of light is sent on a journey of 10,000 metres—in fact, from the Paris Observatory to the Fort Valerien, beyond the Paris fortifications. Arrived at

this station, the ray is reflected back again whence it came, and with such accuracy that it touches the wheel in the same spot that it emerged from. The wheel is now set to revolve, and when at its full speed it may be found that two or three teeth pass in the interim of the light being passed and received back again, when it remains only to be calculated how long these two or three teeth were in moving through space. As we have said, the rate at which the wheel revolves is well known, so that the time taken by that portion of it which is represented by two or by three teeth is easily found, and this corresponds with the period which the ray of light took to travel the 20,000 metres to Fort Valerien and back again. This was M. Cornu's plan of examining the velocity, M. Fizeau, in his earlier experiments, having recourse to a much more restricted field of operations. Still, with all this difference, there is, as we have seen, but very little to choose between the results of the two French philosophers, and they are far better agreed upon the velocity of light than others upon the velocity of electricity.

The Photographs of the last North Pole Expedition.—The Admiralty has been keeping its pictures of the last North Pole Expedition very close. Captain Abney tried his hardest to obtain some of the photographs to illustrate the interesting paper read early in the year before the Photographic Society; but the jealousy of those in office, or the red-tapism of government institutions, prevented a single result being shown to support the communication in question. This is rather hard, we cannot help thinking, seeing that the department over which Captain Abney presided at Chatham furnished much information and instruction in photography to the Arctic officers, and may be said to have placed them in a position to secure the results obtained. At last, however, Whitehall seems to have stirred in the matter, and now, about a year after the return of the expedition, a series of the views has been published under the supervision of Sir George Nares. As it was public money that enabled the pictures to be taken, it seems strange that the public should be kept so long waiting for a peep at the results, and even now, we understand, instead of the photographs being deemed public property, and put at the disposal of any one who would wish to purchase them, it is intended simply to strike off a very limited number of copies, and place them in institutions where practically the general public will never be able to get a view of them. Rumour says that only fifty copies of the pictures will be printed in all, and these will be distributed to the British Museum, South Kensington, and kindred institutions. There are among the pictures some which must prove interesting to disciples of the various sciences, as well as to the public generally. One photograph, for instance, demonstrated the discovery of coal in the Arctic, a solid mass of this valuable material, more than twenty-five feet broad, being depicted. Other pictures show very plainly the nature of the ice masses of which the frozen sea consists, and prove more than all the descriptions in the world how difficult it must be for sledges to make way over this sea of troubles. When we spoke in these columns, three years ago, of the advantages which must necessarily accrue from the use of the camera by the North Pole expedition, we felt sure that the results which would thus be obtained would prove among the most interesting relics of the expedition. And so they have turned out to be. The desolate wastes of snow and ice, the weary aspect of the horizon, the dull leaden hue of the ice-bound landscapes so graphically represented in many of the pictures, give a most graphic idea of Arctic travelling. Altogether, there are one hundred pictures, or rather more, in the series, which Captain Sir George Nares has selected to represent the experiences of the expedition, and we only trust that the Admiralty will in a short time be prevailed upon to permit any of the public, who desire to purchase copies, to have the same by paying the cost price of printing and mounting the pictures.

DISCOVERY OF OXYGEN IN THE SUN BY PHOTOGRAPHY, AND A NEW THEORY OF THE SOLAR SPECTRUM.

BY PROFESSOR DRAPER.*

At first sight it seems rather difficult to believe that an ignited gas in the solar envelope should not be indicated by dark lines in the solar spectrum, and should appear not to act under the law "a gas when ignited absorbs rays of the same refrangibility as those it emits." But in fact the substances hitherto investigated in the sun are really metallic vapours, hydrogen probably coming under that rule. The non-metals obviously may behave differently. It is easy to speculate on the causes of such behaviour, and it may be suggested that the reason of the non-appearance of a dark line may be that the intensity of the light from a great thickness of ignited oxygen overpowers the effect of the photosphere; just as if a person were to look at a candle flame through a yard thickness of ignited sodium vapour, he would only see bright sodium lines, and no dark absorption lines. Of course, such an explanation would necessitate the hypothesis that ignited gases such as oxygen give forth a relatively large proportion of the solar light. In the outburst of *T. Coronæ*, Huggins showed that hydrogen could give bright lines on a background of spectrum analogous to that of the sun.

However all that may be, I have no doubt of the existence of substances other than oxygen in the sun, which are only indicated by bright lines. Attention may be called to the bright bands near G, from wave lengths 4307 to 4337, which are only partly accounted for by oxygen. Farther investigation in the direction I have thus far pursued will lead to the discovery of other elements in the sun, but it is not proper to conceal the principle on which such researches are to be conducted for the sake of personal advantage. It is also probable that this research may furnish the key to the enigma of the D, or Helium line, and the 1474 K or Corona line. The case of the D, line strengthens the argument in favour of the apparent exemption of certain substances from the common law of the relation of emission and absorption, for while there can be no doubt of the existence of an ignited gas in the chromosphere giving this line, there is no corresponding dark line in the spectrum of the solar disc.

In thus extending the number of elements found in the sun we also increase the field of inquiry as to the phenomena of dissociation and recombination. Oxygen, especially from its relation to the metals, may readily form compounds in the upper regions of the solar atmosphere which can give banded or channeled spectra. This subject requires careful investigation. This diffused and reflected light of the outer corona could be caused by such bodies cooled below the self-luminous point.

This research has proved to be more tedious and difficult than would be supposed, because so many conditions must conspire to produce a good photograph. There must be a uniform prime moving engine of two horse-power, a dynamo-electric machine thoroughly adjusted, a large Ruhmkorff coil with its Foucault break in the best order, a battery of Leyden jars carefully proportioned to the Plücker's tube in use, a heliostat (which, of course, involves clear sunshine), an optical train of slit, prisms, lenses, and camera, well focussed, and, in addition to all this, a photographic laboratory in such complete condition that wet sensitive plates can be prepared which will bear an exposure of fifteen minutes and a prolonged development. It has been difficult to keep the Plücker's tubes in order; often before the first exposure of a tube was over, the tube was ruined by the strong Leyden sparks. Moreover, to procure tubes of known contents is troublesome. For example, my hydrogen tubes gave a spectrum photograph of fifteen lines, of which only three belonged to hydrogen. In order to be sure that none of these were

new hydrogen lines it was necessary to try tubes of various makers, to prepare pure hydrogen and employ that, to examine the spectrum of water, and, finally, to resort to comparison with the sun.

The object in view in 1873, at the commencement of this research, was to secure the means of interpreting the photographs of the spectra of stars and other heavenly bodies, obtained with my twenty-eight inch reflector. It soon appeared that the spectra of nitrogen and other gases in Plücker's tubes could be photographed, and at first some pictures of hydrogen, carbonic acid, and nitrogen were made, because these gases seemed to be of greatest astronomical importance, on account of their relation to stars, nebulae, and comets. Before the subject of comparison, spectra of the sun was carefully examined; there was some confusion in the results, but, by using hydrogen, the source of these errors was found out.

But, in attempting to make a prolonged research in this direction, it soon appeared that it was essential to be able to control the electrical current with precision, both as to quantity and intensity, and, moreover, to have currents which, when once adjusted, would remain constant for hours together. These conditions are almost impossible to attain with any form of battery, but, on the contrary, are readily satisfied by dynamo-electric machines. Accordingly, I sought for a suitable dynamo-electric machine and motor to drive it, and, after many delays, procured a combination which is entirely satisfactory. I must here acknowledge my obligations for the successful issue of this search to Professor George F. Barker, who was the first person in America to procure a Gramme machine. He was also the first to use a Brayton engine to drive a Gramme.

The dynamo-electric machine selected is one of Gramme's patent, made in Paris, and is a double light machine—that is, it has two sets of brushes—and is wound with wire of such a size as to give a current of sufficient intensity for my purposes. It is nominally a 250 candle light machine, but the current varies in proportion to the rate of rotation, and I have also modified it by changing the interior connections. The machine can produce as a maximum a light equal to 500 standard candles, or by slowing the rotation of the bobbin the current may be made as feeble as that of the weakest battery. In practical use it is sometimes doing the work of more than 50 large Grove nitric acid cells, and sometimes the work of a single Smee.

The Gramme machine could not be used to work an induction coil when it first reached me, because when the whole current was sent through the Foucault interruptor of the Ruhmkorff coil, making 1,000 breaks per minute, the electro-magnets of the Gramme did not become sufficiently magnetized to give an appreciable current. But by dividing the current so that one pair of the metallic brushes which collect from the revolving bobbin supplied the electro-magnets, the other pair could be used for exterior work, no matter whether interrupted or constant. The current obtained in this way from one pair of brushes when the Gramme bobbin is making 1,200 revolutions per minute is equal to 100 candles, and is greater in quantity than one would like to send through a valuable induction coil. I usually run the bobbin at 622 revolutions per minute, and this rate will readily give 1,000 ten-inch sparks per minute with the 18-inch coil. Of course a Plücker's tube lights up very vividly, and generally, in order to get the maximum effect, I arrange the current so that the aluminium terminals are on the point of melting. The glass, particularly in the capillary part, often gets so hot as to char paper.

As long as the Gramme bobbin is driven at a steady rate the current seems to be perfectly constant, but variations of speed make marked differences in the current, and this is especially to be avoided when one is so near the limit of endurance of Plücker's tubes. A reliable and constant

motor is therefore of prime importance for these purposes. A difference of one per cent. in the speed of the engine sometimes cannot be tolerated, and yet at another time one must have the power of increasing and diminishing the rate through wide limits. The only motor among many I have examined and tried, that is perfectly satisfactory, is Brayton's Petroleum Ready Motor.

This remarkable and admirable engine acts like an instrument of precision. It can be started with a match, and comes to its regular speed in less than a minute; it preserves its rate entirely unchanged for hours together. Moreover, it is economical, cleanly, and not more noisy than a steam engine. The one of two-horse power I have ran for six months, day and night, supplying water and air to the aquaria in the Centennial Exhibition at Philadelphia. At any time, on going into the laboratory, it can be started in a few seconds, even though it has not been running for days.

OLD TIMES.

DAGUERREOTYPING IN THE BACKWOODS.

BY GIBBON-FITZ.*

"THAT's the chap—him with the white hat, fat and short like our old sow. Stand back, boys, and let me talk to the image man. Hello, stranger, are you him?"

"Whom do you mean, my friend?"

"Well, now, I didn't say I was your friend, howsumever, we wants to know if you are the Doggery-type man that sent them big bills out here? Hold on, I'll show you one on 'em," at the same time diving his hand into his coat tail, he pulled out one of my large posters.

"I profess to be the artist, gentlemen, and shall be at your service shortly."

"Bill, you hear them big words? Send for Caleb's larnin book till we know what he's comin over us."

Such was the reception I received at a small town called Sovereignville, near the borders of Missouri, Arkansas, and the Cherokee Nation. The crowd consisted of a motley group of half-breeds and whites of both sexes, that came crowding round as I alighted from my wooden elliptic spring wagon.

Shortly afterwards I took a stroll over the town. It was what is generally denominated a "one-horse town," and I would think a tolerably small pony at that. Two stores, one grocery, a stable, and four dwellings made up the sum of its buildings. I was searching for a room for operations, and in passing I was accosted by an old chap with, "What are you a-hunting for, stranger?"

"Nothing but light," I replied.

"Why, you're not blind, I don't think; I see plenty of light."

"You don't understand me, my friend. I am looking for a room suitable for taking Daguerreotype pictures in—a room with a good light."

"Oh, I reckon you's the great little man what's a-gwine to take off our heads with a chimera. Maybe I can fix you off. My darter Polly's got a bedroom. Polly can gin up her bed and sleep on a pallet. You won't take pictures by night, will you, stranger?"

"No, not Daguerreotypes."

"Well, Polly axed when you come to get her fizzy-germy took, so you must close the bargain with her 'bout the room."

Polly and myself soon "struck a trade," and I began arrangements for operations. In course of a few hours I announced myself as ready to take likenesses of all who wished them. In a short time my room was crowded. All the cases for exhibition on the table were opened and reopened a thousand times; the contents of my trunk turned over and over, the camera scrutinized before and

behind. Thinks I, this is all talk and no cider; and I asked if there was any lady or gentleman present who wanted a picture? A dead silence ensued; then a titter. At length one of the chaps spoke up to his sweetheart, "Betse, 'spose you have your pretty taken?"

"No, Bill, you front the glass awhile, and see how it works on you."

"I golly," says Bill, "I'll try it. Is thar any danger of the machiues bustin, stranger? I've heard you've got an all-fired lot of chemicals and acids in thar."

"No danger in the world, sir. All you have to do is to keep still for a few seconds." I then began to place him in position—

"Hold on here, stranger—none of your steel-traps and triggers about my head."

"Softly, my friend, I am only placing your head in the rest for the purpose of keeping you steady."

"Hold on, I tell you; you're not a-gwine to screw me up; I'm not the sort to be screwed, I can tell you, and if you don't quit, I'll slope."

I then explained as distinctly as I could the nature of the operation, and Bill became easy. His position was taken again, and I was just about to draw the slide from the plate-holder, when he cried out, "Betse, whar's the meal bag?"

"Keep very still and quiet now, if you please," said I.

"Whar's the meal bag, Betse?" cried Bill again. "Stranger, there was a doggery-type man here from Maysville, that made Reuben Frother's face right black on one side, and several of their faces black the same way. Now, me and Betse fetched the meal bag along to whiten one side of our faces, so when the machine works on us we'll be the same thing on both sides." So, slap, slap, went the meal bag on the side of his face, and Bill agreed to be "dattered if both sides wouldn't be white now." I said not a word—in fact, I was amused beyond laughing, and quietly carried on the process. The whole crowd had great faith in the meal bag arrangement. The artist who had visited them had indeed only given them *half* pictures.

In a few moments the picture was produced. I did not show it to my sitter, for the reason that I hold it for Barnum, who when he beholds it will dance, shed tears of joy, and thenceforth regard me as his Magnus Apollo, his greatest benefactor.

After a good deal of trouble, I explained to my patrons that the black pictures were not the result of the camera, but of the operator, and that I would produce them pictures as white as they wanted.

At another trial (without the meal bag) I succeeded in a fine likeness of Bill, who exclaimed, on seeing it, "Stranger, you're the greatest dogman that's bin in these parts. Jump in here, Betse, and let's have you."

Betse sat down, and Bill wanted to look at her through the instrument. I permitted him, as soon as I got the focus adjusted.

"Look out, stranger," said Bill, when he peeped in, "your noggin's in danger. Turn that hogany box over—Betse is bottom upwards. I don't 'low sich jokes as this, stranger. Betse aint to be turned up that way. Over with her!"

"My friend," says I, "Miss Betse is in no danger. Her position is caused by the instrument," and after a considerable explanation, convinced him that I was not intending to make game of his girl.

Betse's likeness was obtained "right side up," and Bill was overjoyed. The crowd was highly pleased, and went away as the sun declined, with the promise to devote tomorrow to my services; and I thought that night, as I cast myself, wearied with the day's exertions, on my bed, "Jordan is a hard road to travel."

AN AMERICAN PHOTOGRAPHIC WAREHOUSE.

WE find in the New York *Commercial Pathfinder* a long and graphic account of the photographic warehouse of Messrs. E. and H. T. Anthony, which is probably the oldest warehouse devoted to photographic goods now in existence. As the article will interest many readers we reproduce it here:—

"Progress is the order of the day. But progress implies change; and photography, though one of the younger arts, has proved quite as susceptible of ceaseless modification and improvement as many of the older and less interesting ones. Many years ago, in the infancy of the then new discovery, an article appeared in the magazines, by Professor Oliver Wendell Holmes, who conceived the details of the preparation and manufacture of materials connected with photography by the above-mentioned house to be of sufficient importance to enlist the service of his graphic pen.

"Photography in that day was deeply interesting and delightfully novel, but, compared with the present, it was, as it were, but the embryo of future possibilities. To follow in detail the upward course of the art in all those fleeting years would be foreign to the purpose of these lines, though undoubtedly many of the advances made are due to superiority of the provided means and supplies, as well as to improved methods. Our object is rather to describe generally the manufactures and premises of the firm to-day in their several establishments in New York and elsewhere.

"In addition to the materials requisite for the practice of photography, there are many collateral manufactures more or less nearly allied with it; such, for instance, as the making of albums, the printing of stereoscopic prints and portraits, the manufacture of stereoscopes and the recently introduced graphoscope, the production of beautiful transparencies for the window (which have lately become so popular) and for use in the magic lantern, the making of velvet passe-partouts, frames, and cases as settings for portraits, and the manufacture of the magic-lantern in all its more modern excellence and variety.

"The manufactures specially connected with photography embrace those of pyroxyline, collodions, varnishes, and other compounds, a great variety of chemicals (which require to be exceptionally pure and determinate in character), the albumenizing of photographic papers, and the manufacture of camera obscuras, apparatus, and accessories of the photographic studio.

"It will be very readily seen that the successful production of all these varied materials requires correspondingly diversified knowledge and skill. Chemistry, mechanics, and a certain estimate of the necessities of the trade, are alike indispensable, and finally, a large endowment of tact and unremitting industry to mould these factors into congruous unity and use.

"Some of these results have only been achieved by a long and systematic course of experiments, especially in the combination of many photographic compounds and the fabrication of their components. So delicate and important are some of these, that the slightest deviation from a prescribed formula would result in ruin to reputation and severe loss. The duty of determining these proportions devolves upon Mr. H. T. Anthony.

"Besides the large and commodious buildings united at Nos. 591 Broadway and 164 Mercer Street, where those splendid products of the camera—photographic transparencies—are made, the Messrs. Anthony occupy five distinct factories, or workshops, two of them in New York city (one over the freight depot of the New Haven and Harlem railroad in Center Street, and the other over the premises of the Adams Express Company, at No. 65, Broadway), and three in West End, New Jersey, where a considerable parcel of land is held in reserve for future emergencies.

"In the Franklin Street factory (over the freight depot)

there are printing presses, binders' presses, cutting machines, &c. Here are seen printing and embossing of album covers in endless variety of styles and all stages of advancement. Some of the operations of these machines are very interesting; so also are those of the printing presses, which not only beautifully print the 'insides' for albums, but punch or perforate the openings at the same time. Here also are cut and trimmed immense quantities of straw-board, card-board, and paper for the various departments.

"THE FACTORY AT NO. 65, BROADWAY.

"In this spacious building (40 by 220 feet in extent, and on three successive floors) are seen crowds of busy hands. The lower floor is devoted to the selection, trimming, mounting, and labelling of stereoscopic views, the manufacture of velvet frames, and *passe-partouts*, photographic cases, stereoscopes, the gilding of albums, &c. In one direction may be seen a number of workers, male and female, old and young, with dexterous fingers fitting and filing, nailing and punching, gluing and uniting the various parts of the stereoscope—that simple little instrument which reveals so much. Of these there is a large variety adapted to every caprice. Still further on are others engaged in arranging, in tasteful form, those delicate velvet frames which, with their blue and violet and many-coloured trimmings, are so well adapted to the now-popular photochrome and similar pictures. Here, too, are made those charming little oval velvet cases, so nice for miniatures, and all the more staple goods in that line.

"Opposite are a bevy of girls assigned to the care of stereoscopic views. There is something fitting in this, for standing among these weird little waifs of the camera, they follow in almost fabulous succession, appealing with powerful effect to the imagination. First may come a representation of the streets of New York, then a view down the Bay, or a glimpse of the Central Park; then perhaps, the majestic Niagara, the Yosemite, our East River Bridge, or the Island of Juan Fernandez, the princely elegance of Paris, or a panoramic view of Jerusalem, the Holy City.

"Next above the space is mainly devoted to the albumenizing of photographic paper—one of the more important, if not romantic, sub-divisions of the business. The labour of mounting, or stretching and varnishing, of chromos is also assigned to this floor.

"The upper floor is mainly appropriated by the album makers. Here may be seen the process called 'album building,' by which the 'insides' are 'built up' from simple sheets of printed and perforated boards into albums of different sizes and styles, afterwards to be covered, and the edges gilded and chased.

"WEST END.

"From No. 65, Broadway, to reach their West End factories in New Jersey, it will be necessary to take the steam cars in Jersey City, and after a five-minute ride and a four-minute walk, we arrive there.

"The smaller building (30 by 35), with the large chimney, to the north of the inclosure, is wholly devoted to the manufacture of what is commonly known as gun-cotton, a soluble pyroxyline for the preparation of photographic collodions, together with some of lower grade for other commercial purposes. Here the carded cotton may be seen immersed in certain proportions of nitric and sulphuric acid at a high temperature, after which it is removed with glass rods to earthen tanks for cleansing. It is then removed to the drying room, another building (20 by 30), some distance westward, where it is spread on shelves to dry.

"Between the two last-mentioned buildings there is another (30 by 70), divided by a party-wall into compartments—one for the manufacture, bottling, and packing of

collodion and ether, and the other similarly for photographic varnishes.

"In the main building (50 by 80), the lower floor constitutes the laboratory, wherein the more important chemicals are made, as well as the refining of photographic residues, &c.

"The floor above is occupied for toning and fixing photographic prints, operations which require the exercise of much judgment. In the loft above are stored thousands of negatives; whilst the upper one is given exclusively to printing from these negatives. Skill, neatness, regularity, and order are indispensable in this department. From this building the prints are transferred to No. 65, Broadway.

"THE STORE, No. 591, BROADWAY.

"The business of this firm (or rather Company, incorporated April 1st, 1877) is now conducted at No. 591, Broadway, extending to and including No. 164, Mercer Street. The lower floor (front) is occupied solely with and for the sale of stereoscopes and views, lanterns and slides, and portraits of celebrities; the middle portion for the sale of photographic materials, and the rear for packing and shipping.

"The next floor above (front) is reserved for the sale of chromos, engravings, photographs, albums, and an almost endless variety of frames, mouldings, &c. It is elegantly fitted with paintings, chromos, transparencies, and kindred articles, and is a favourite resort for persons of taste and leisure.

"On the floor above are stored passe-partouts, frames, albums, and chromos, where they are also prepared for shipment.

"The upper floor is devoted to the making of photographic transparencies, a department for the finishing and framing of pictures, and a goodly assortment of larger frames.

"In the rear building, above the store, are, first, a room for the preparation of orders for chemicals, glassware, &c.; above are kept apparatus and materials for the photographer.

"In the upper loft are stored hogsheads and crates of porcelain ware, barrels and tiers of glassware, boxes of apparatus, &c., a portion of it being divided into a room for the preparation and arrangement of lantern outfits and experiments connected therewith.

"Immediately below the latter is a compartment reserved expressly for the purpose of making chemical analysis and experiments.

"It is impossible, in a brief sketch like the above, to convey an adequate idea of the extent or variety of details which this establishment has directly under its management; but there are many other departments, with large interests involved, which are engaged in the manufacture of the less important requisites of the trade exclusively for this leading house, and solely dependent on its patronage.

"Nowhere, perhaps, in either of the great centres of traffic can there be found so complete or renowned an emporium for the sale and manufacture of materials connected with the photographic art."

HOW TO PREVENT BLISTERING.

In spite of the many remedies for blistering which have been proposed, some photographers are still troubled with it. Here is a remedy given by a correspondent of *Anthony's Bulletin*, which is said not to fail:—

"We have at last succeeded in hitting upon a means which in all our trials has given the most satisfactory results. We think it a sure cure for blisters, and we hasten to advise you of it, viz:—

"The sheets after having been taken from the toning

bath are to be washed in clean water, and then put, if possible, each sheet separately, into a water bath, being mixed with three to five grains of C.P. muriatic acid to a quart of water. In this bath, kept in continual motion, the sheets are to float two to three minutes, and then to be washed again two to four minutes in clean water, to make them free from the muriatic acid. On hot days this washing is to be continued longer than on cool days. After this one proceeds to the fixing. Should the finished copies—an accident which will scarcely occur—show a yellowish tint, the sheets after the muriatic acid bath are to be drawn through a solution of liquid ammonia five grammes in one quart of water, during one to three seconds, afterwards washing the sheets once, and then proceeding to fix in the ordinary way. By this manipulation any alteration of tint is quite impossible."

RETICULATION IN CARBON PRINTS.

[MR. P. C. DUCHOCHOIS, an experienced photographer in the United States, writes to *Anthony's Bulletin* describing a cure for the troublesome reticulation in carbon prints. He says:]

I think that this communication to the *Bulletin* will be welcomed by all the licencees of the chromotype or carbon printing, for, to my knowledge, no method has been published by which the reticulations can be surely avoided. During this hot and damp summer I had, as well as everyone working this beautiful process, my good share of trouble to avoid this capital defect, in trying, without success, all that has been published by Liebert, Vidal, Lambert, the Autotype Co., &c. As this defect occurs only in warm weather, and is consequently mechanical, I thought that the remedy should be searched in other directions than those we were told to look for; and . . . I have succeeded in finding a process simple, sure, and, I think, new, by which the reticulations are impossible. It is simply to transfer the sensitive tissue on a glass waxed and collodionized, or well waxed only. I prefer the former. The excess of bichromate solution must be taken away with the squeegee, and no bubbles of air allowed to remain between the tissue and the collodion. The tissue is stripped off the glass when well dry, and only at the moment of printing, as it keeps better and remains perfectly flat to be laid on the negative. The bath should be at 2½ per cent., without ammonia, and at a temperature not exceeding 50°F. Immersion, two minutes. Many photographers have also found, during this summer, something new in the chromotype process; we all hope that ere long they will publish the results of their observations and researches.

[The Editor adds:]

We welcome from any quarter suggestions made for the purpose of meeting difficulties, whether in the carbon or silver process. We have no doubt that the trouble experienced in some quarters in working chromotypes in hot weather will eventually be overcome. We thank Mr. Duchochois for his important communication, and much commend the brotherly spirit evinced by our carbon workers, who are so willing to impart to others that mode of working whereby successful results may be attained. Will such of our readers as try this process be so good as to communicate the results?

TO REMOVE SILVER STAINS FROM FABRICS.—This process is especially successful in removing spots from materials which have been several times washed. First prepare a saturated solution of chloride of copper, dip the spotted piece in the solution, and allow it to remain some minutes, or according to the character of the stain. Then rub the part with a crystal of hyposulphite of soda. When neutral chloride of copper is used the colour of the stuff does not change. This process can be repeated.

The Photographic News.

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COLOURING PROCESSES FOR PHOTOGRAPHS.

PERHAPS one of the most natural impulses which could occur to an artist on seeing the perfection of detail and drawing in monochrome which the photograph presents, would be the desire to add to perfect drawing the charms of colour; and it is probable that whilst the miniature painter's immediate occupation was destroyed by the advent and progress of photography, a greater number of colourists are now employed in connection with photography, than ever made a livelihood by painting likenesses. But painting on the photograph not only requires highly skilled labour, but perpetually risks more or less of alteration and hiding of the drawing in the photograph; and it is, moreover, at best, a slow and costly process. Hence there has been from the early days of photography a hankering after some process of colouring—something which should give results not altogether unsatisfactory, without the elaborate treatment of the artist painting on the picture, and something, moreover, not liable to hide or alter the photographic impression. A large number of allied processes of colouring the photograph have been devised, in almost all of which the drawing of the photograph was to be superposed upon crude colouring applied in various ways. A favourite method has been to make the photograph transparent, and apply colours crudely and brilliantly at the back of the print, or on another print to be placed in contact with the transparent print. This method has been extensively applied in different forms. In some cases the transparent photograph was a paper print, made transparent with wax or varnish; in some cases a collodion print; and latterly an unmounted carbon print. In some cases the colouring was applied by hand, and in others it was printed by lithography or other means. But the general principle was the same in all cases. M. Vidal's recent fine results have been obtained on this principle, and Mr. Woodbury has produced some fine imitations of painting, lithography having been called to the aid of both gentlemen.

One of the most recent applications of process to the colouring of photographs has been patented by Messrs. Lombardi and Co., and the public are invited to examine the results which can be produced at their galleries in Pall Mall and in Brighton. Of the nature of the process we have no information, as the specification is not yet published, and we fear that the patentees are in danger of making the fatal mistake of believing that secrecy and patent protection are compatible, and can both be made available. Of that, however, we shall be better able to speak when the specification is published. In the meantime we have pleasure in saying that, so far as the results are concerned, they are by far the finest we have ever seen produced by a process, and fully justify, by their

excellence, the intimation we have received, to the effect that whilst there is a method capable of protection by patent, the excellence of result depends on the application of the method by the hands of a skilled artist. The examples exhibited by Messrs. Lombardi are chiefly copies of the paintings of great masters, and are admirable in every way. The accuracy of drawing in such reproductions of course cannot be subject of doubt, being the work of photography. The colour has all the force and all the mature tone and richness of the masters represented. There is a singular absence of the garish rawness of the olograph copies of old pictures with which the art market has been flooded of late. The poikilographic oil paintings, as they are termed, are at once brilliant and mellow, forcible and soft, and fitted to please the most highly cultivated and critical taste. The method is applicable, we understand, and intended to be applied, to modern portraiture; and we believe it is the intention of the firm to undertake commissions from "the trade" on liberal terms. But of this form of application we can say nothing, not having seen examples. The subject is interesting, and the specimens are well worth a visit from all who have opportunity.

We have before said that some of the methods of colouring we first mentioned have been the subject of many patents. Notwithstanding this, it continues to form the basis of new patents at intervals, with or without modifications. We have before us a recently issued specification of a patent taken by Mr. H. E. Newton, a communication from M. C. Rousseau, of St. Etienne, in France. From the specification, which we subjoin, it will be seen that the superposition of a carbon print over a rough colouring, or the colouring at the back of the film, constitutes the supposed novelty. From the moment that a transfer carbon process was invented by Mr. Swan, it became obvious to any one familiar with these methods of colouring that the insoluble gelatine image produced would lend itself admirably to this style of finish. And in the first work issued on the subject—our own volume on Pigment Printing—we suggested that the touching out of defects should always be effected at the back, so that the finished print should not show the treatment with the pencil and pigment. The specification here is headed "An Improved Process for Obtaining Pictures in Colour, a communication from abroad by Cheri Rousseau," and is as follows:—

The object of this invention is to obtain pictures on canvas or other permanent backing in colours by the aid of the carbon photographic process in lieu of employing the skilled artist for producing such pictures. The process is applicable to all kinds of pictures, such as portraits, landscapes, still life, and the reproductions of paintings. In carrying out the invention a photographic carbon print of the object to be reproduced is first obtained, this print is then mounted on a temporary supporting paper in a reversed position, the photographic picture is then tinted with colours prepared with any suitable medium, but all colours will by preference be generally employed. The colours of whatever kind are thickly applied with a brush, care being taken to follow the details of the subject in their appropriate colours. When the crude colours thus carefully applied to the carbon print are dry, the whole surface of the picture is coated with some adhesive substance, and while wet it is transferred to the canvas or other permanent backing, and caused by gentle pressure to adhere thereto. The supporting paper which still covers the face of the carbon print is now to be removed in the manner ordinarily practised in the remounting of carbon prints, after which the coloured picture will be presented to view, the crude colours being toned down and blended with the tints and shadows of the photographic print. The paper for temporarily supporting the carbon print in reverse may be prepared with stearine, alcohol, and resin, or with caoutchouc dissolved in benzine; but papers of this kind being readily found in the market it will be unnecessary to describe their mode of preparation. It will be understood that the coloured pictures when transferred to their canvas or other backing may, if desired, be re-touched on the face to remove any defects in the photograph, and to give increased force to the lights and shadows of the picture. This operation, as it requires great skill and judgment, can only be entrusted to an experienced artist. Having now set forth the

nature of the invention of "An Improved Process for Obtaining Pictures in Colours," as communicated to me by my foreign correspondent, and explained the manner of carrying the same into effect, I wish it to be understood that under the above in part recited Letters Patent I claim, producing coloured pictures upon a canvas or other permanent support by applying colours in oil or other media to carbon photographs mounted on a temporary paper or other support, and attaching the same when dry to the canvas, and then removing the temporary paper support from the face of the picture.

THE COFFEE PROCESS AND EMULSION PROCESSES.

THE relative value of emulsion processes and bath processes for dry plates becomes a very interesting and important question. In simplicity, and in the philosophic character of the process, emulsion work may, we think, take precedence of most of the bath processes. But the more vital question is that of excellence. No process, however simple, easy, and philosophical, can for a moment secure preference if it be in any degree inferior in results to the old and tested processes. We have seen many results from emulsion plates leaving nothing whatever to be desired; and we have seen trials as to rapidity between emulsion plates and other dry plates, and even between emulsion plates and wet plates, in which the former undoubtedly bore the palm. But we have not hitherto seen any comparative experiments made with care, under test conditions, to determine the relative excellence obtainable by the different methods. We have received, however, a communication, which we subjoin, from a gentleman whose care and manipulative skill are beyond question, in which he records his experiences with emulsion plates as compared with coffee plates. Our readers will remember the high terms in which we have frequently mentioned the prints from coffee plates with which we have been favoured by Mr. J. H. Whitehouse, of Ouchy, Geneva. He has recently been trying some of Newton's excellent emulsion obtained in New York.* He is prepared to speak of its results favourably, especially as regards rapidity; but is compelled to record that, for excellence of result, it is not comparable to the coffee process he works, which has been fully described in our pages. This, he frankly admits, may be due to his mastery of one process and lack of familiarity with the other. It must be admitted that in this experiment the emulsion is tried by a high standard, as Mr. Whitehead's landscapes by coffee are only comparable to some of the best of such men as Russell, Manners Gordon and Henry Cooper. We subjoin his communication:—

"As Newton's emulsion appears to attract considerable attention at present, it may interest some of your readers to learn some particulars of its behaviour in the hands of an amateur.

"As you know, I personally am *hopelessly* prejudiced in favour of the *coffee process*; still, believing in progress, and that the future contains more than the past, I am by no means disinclined to giving a trial to new things (though, thus far, photographically, the result has not been such as to encourage me in this cause). Consequently, when in New York last spring, and seeing in the *Scientific American* a very favourable notice of Newton's Emulsion, I called at the Scovill Manufacturing Co., the agents for its sale, to make some enquiries regarding it. I was there referred to Mr. Price as being the gentleman best informed upon the subject, and he most kindly gave me all desired information, and showed me some beautiful specimens of work done by this process. I was so pleased with what I saw and heard, that I concluded to take a small quantity of the emulsion to Europe with me, in order to give it a trial, though, as Mr. Price suggested, it would be much better if I could first call upon Professor Newton, and see his own manipulation, instead of trusting to printed in-

structions only. I was, however, unable to do so; but simply following the directions which accompany each bottle, I have met with sufficient success to induce me to send to America for a further supply of the preparation.

"I have not, it is true, as yet succeeded in producing results which would bear any favourable comparison with the specimens shown to me in New York, nor such as could for a moment be compared with much that I have done by the 'coffee process'; still, *this proves nothing against the real merits of the emulsion*, as all deficiencies and shortcomings—in view of what Professor Newton has accomplished with it—are fairly attributable to want of experience or some possible error or omission on my part.

"I was most successful when using rather a smaller quantity of pyrogallie acid in the developer than is given in the directions—say three to four grains, instead of four to six to the ounce—but even then the negatives were wanting in brilliancy and vigour as compared with coffee dry or ordinary wet plates, and to know the probable cause of this difficulty I have written to New York for further information.

"The emulsion, which is snowy white, and of about the consistency of cream, flows most smoothly and readily over the plate. Nor when albuminized according to direction is there the *slightest risk* of the film slipping; and in these respects, as well as in its *extreme rapidity*, I should unhesitatingly say that the emulsion fully comes up to all that is claimed for it, while certainly nothing can well exceed the simplicity of its application. I hope a little more experience will enable me to send you some creditable specimen by this new process.—Yours truly,
"Ouchy, August 28th." "J. HENRY WHITEHOUSE."

FRENCH CORRESPONDENCE.

THE IMPORTANCE OF CLEAN PLATES—HOW TO POLISH THEM THOROUGHLY—THE GELATINO-BROMIDE PROCESS IN FRANCE—ODAGIE'S PAMPHLET ON THE SUBJECT—THE ADVANTAGES OF THE PROCESS.

IT cannot be too often repeated that the minor operations in photography exercise a vast influence upon results which are to be perfect, and for this reason the observations of a practical photographer so experienced as M. Boivin upon the cleaning of glass plates to be employed in the dry process must of necessity have an interest for the painstaking readers of the PHOTOGRAPHIC NEWS. I will therefore resume, for their benefit, the principal points of a communication just received from my estimable collaborateur upon the subject in question. The cleaning of glass plates is, without exception, the most toilsome manipulation connected with photography, and in dry processes it requires very particular care and attention, for any negligence may at once give rise to failure. In the first place the plates should be chosen free from scratches and air-bubbles, and, indeed, imperfections of any kind; the edges should be ground before commencing work, and the less perfect surface should be marked at one of the corners with a cross, so that when it comes to applying the film this should be applied to the more advantageous side. The method adopted by M. Boivin for cleaning his plate is then as follows:—The glass plates are first of all immersed in a strong solution of ordinary commercial soda; they are then washed in ordinary water, and plunged in a bath of nitric acid diluted with water, where they remain for about twenty-four hours. On coming out of this bath they are washed once again in pure water, and then covered with a thick mixture of chalk and water, which is applied by the aid of a bit of rag. This chalk is not removed until the plates are about to be employed; to effect this a few drops of a tincture of iodine is employed (a few scales or decigrammes of iodine being dissolved in one hundred grammes of alcohol), with which the chalk mixture is moistened. A woollen rag is then rubbed

* We believe it may also be obtained of Mr. Atkinson, of Liverpool.

over the plate to remove the chalk, and some tale is afterwards applied with another rag or tuft of wool, the glass being finally polished with a piece of flannel. It is important that the flannel and woollen rag should be first of all washed in a solution of soda, so that they may be freed completely of any traces of grease. When the plates are to be used, it is possible to assure oneself of their perfect cleanness by breathing upon the surface in the ordinary way, a camel-hair brush being passed over the surface to remove any dust particles. If the cleaning is to be perfect, it is necessary that the plate should not be rubbed too much; if too much friction is used, not only do you fail to clean the glass, but you render it, in fact, more dirty than before. The rag held in the hand absorbs perspiration from the fingers, which is subsequently transferred to the plate itself.

The gelatino-bromide process, which till now has not counted a single disciple in France, may, in a little while, acquire the favour it has already secured in England. An amateur, who has made use of the method with considerable success, has just published a very complete description of it, adding to his communication a translation in *extenso* of Mr. Palmer's memoir, which has already appeared in the PHOTOGRAPHIC NEWS of the 10th March, 1876. Another article on the same subject, by Mr. Kennett, also finds a place in the pamphlet. The whole forms a small volume, which has just been published by Messrs. Gauthier-Villars, in Paris. The author, who is, it appears, a magistrate and artist, has adopted the *nom de plume* of Odagir. He presents his readers with a résumé of the memoirs of MM. King, Bolton, Fox, Mawdsley, Stuart Wortley, Kennett, and Palmer, which have led to the improvement of the gelatino-bromide process, and have placed it in the advanced stage it occupies at the present moment.

The cleaning of glass plates, of which we have just spoken, appears to our author a very simple matter; it is sufficient, he assures us, to pass over the surface a dry linen rag and a little dry tripoli, and then to draw a camel's hair brush over them the moment the emulsion is to be applied. To remove the latter, washing in warm water is sufficient. The sensitive liquid, which is applied to the middle of the plate, is spread very easily by the aid of a glass rod, or even with the finger. The film adheres very tenaciously, and does not become detached on development. Contact with the fingers does not leave behind any stain or spot, as in the case of collodion. The adherence of the film is, in fact, so complete that varnishing may be dispensed with. The sensitiveness of gelatino-bromide plates being very great, the exposure in the camera must be a short one; a few seconds suffice, according to M. Odagir, to bring about what would require minutes in the case of all other dry processes. Foliage is admirably depicted by means of the gelatine emulsion, adds the author, and distance is rendered with exceeding delicacy. The development of the plates is very rapid, and, on the whole, the process is a very economical one, for the employment of ether is altogether suppressed, the vapours of which, moreover, are very unhealthy, if not actually dangerous. It will be seen that the author is a great enthusiast in respect to the gelatino-bromide process.

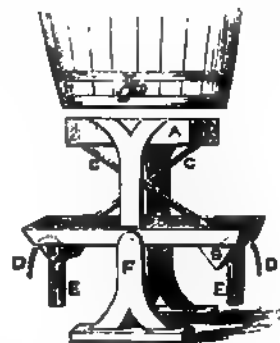
ERNEST LACAN.

A SELF-ACTING PRINT WASHING MACHINE.

BY W. A. NICHOLAS.

I SEND you a sketch of a self-acting washing machine I had made for washing prints, a description of which may be useful to some of my brother photographers. A is a dish to contain the prints, with openings each end to carry off the water. BB vessels to receive the water after running through the prints. CC shoots to conduct the water from top dish. DD self-acting syphons to draw the water off from bottom vessels. EE two short legs to keep the machine from rocking over too far. F stand. To set it in motion proceed as follows:—Place the prints in the

top dish; turn on the water; as soon as the water rises to one of the openings one of the shoots (C) will convey it to the opposite side under vessel; as soon as that gets suffi-



ciently weighted with water it will cause the machine to rock over to the other side, thereby giving the prints a good moving about; the water will then run out of the opening at the other end of the dish, and be conveyed by the shoot to the opposite end under vessel; while that is going on the syphon D draws off the contents of the now full vessel, then by lightening it ready to rise again as soon as the other fills; as each vessel fills and empties itself, so it rocks backwards and forwards. Mine has a fall of between three and four inches, which knocks the prints about with sufficient force to turn some of them over—it does not break them.

I would not be without mine on any account, as all I have to do is to turn on the water, and I know that about every two pints of water that runs through the prints gives them a good shake up. Mine is very simply made. The top dish, fourteen by ten by four inches deep, is made of japanned tin, as also the under vessels, and the frame of light wood working on a loose axle. As will be seen by the sketch, the syphons are let through the sides of the vessels, so that when it cants over the syphons become covered by the water, which, of course, causes them to act. Distance from axle to top of dish, eighteen inches; same from axle to outside edge of under vessels.

Should any photographer take the trouble to make one, it will fully repay him.

ON HARDENED GLASS FOR LABORATORY PURPOSES.

BY J. W. SWAN.*

"To supply me with flasks and beakers, almost as resistant of the destructive agencies of fire and hard knocks as cast-iron." That was the attractive proposal made to me a few days since by the representative of a company now working M. de la Bastie's process for hardening or tempering glass. Samples were provided, not of flasks and beakers, but of other vessels that would sufficiently illustrate their properties. I immediately, and with great eagerness, gave myself up to experiments with some of the vessels. Some of them are here to-night, and are at the service of the members for the purpose of experiment. The result of my experiments are at least interesting. I found that even in a very thick basin water might be boiled, by means of a naked flame strongly playing upon it, without fracture; that the hot vessel might, without harm, be lifted off the stand with cold tongs and set upon a cold plate of iron; that altogether it bore an amount of ill-usage that was extraordinary. Then I thought I would subject it to a severer test; I therefore only partly filled the basin, and allowed the flame to play upon a larger surface of the glass than was covered by the liquid, so that the margin of the basin might be heated above the boiling-point. I did this with the idea that pro-

* Read before the Newcastle-upon-Tyne Chemical Society.

bably under those conditions the temper of the glass might alter or be destroyed where the glass was more strongly heated, and if it was destroyed, that fracture would almost certainly result. The agent of the company said no, but the fragments—the results of two experiments of exactly the same kind—say yes. The character of the fracture is worthy of attention; you will observe that the bottom, which was covered by the water, is broken in small pieces like hardened glass, and that the rim has broken in larger pieces with sharp-cutting angles—in fact, like ordinary untempered glass. Possibly tempered glass may in some instances prove useful in the laboratory—for the much-abused water bottle, for example—but for general purposes of the analyst, in place of flasks and beakers of thin glass, the experience which I have so far had of it makes me very doubtful of its utility.

SPIRIT PHOTOGRAPHS.

THE *Springfield Republican*, an American journal, has a curious exposure of this fraud. It says:—

“Photographing spirits must be the highest reach of the art—far above the commonplace reproduction of mundane countenances and forms. It is a precious thing for a great many bereaved ones, who find in a faint, blurred image a perfect likeness of some departed friend or child. Moreover, it is slightly more profitable than plain photography, even if it is the most wretched work possible; and for eight dollars a dozen of common cards, and one dollar for each extra sitting, a popular spirit photographer can manage to live, and even bear to suffer the tender drain made upon his vitality by the spirit control. So, last week, thought a spirit photographer of Boston, but he has changed his opinion. This person has been notably successful in obtaining spiritual effects, and has successfully borne pretty careful watching by the regular photographers of Boston, who have agreed that they could discover nothing wrong about his performance. His fame spread abroad. Not a few Spiritualists in this city have obtained pictures of themselves with spiritual attendants at their sides; and he had been engaged to attend as a spiritual artist at the Lake Pleasant camp meeting. Now this is over.

“Last week, at the instance of prominent Spiritualists, Mr. Charles Moore, of Moore Brothers, called on the photographer one morning in the character of a man very anxious to get a spiritual picture. He couldn't feel satisfied with one trial, nor even with two, but, after the second, the gentleman remarked that unless he could be left alone a short time he felt very uncertain whether he could get any more spiritual effects; the fact was, Mr. Moore's presence weakened the influence. And, sure enough, the third and fourth trials were not blessed with any ghostly presence at all. The result of Mr. Moore's unremitting attention to the photographer's doings was a surprise to that gentleman. They had only a little conversation that day, but the next morning Mr. Moore revisited him in company with the Boston artist, Black, and had a more emphatic interview. On his inquiry Mr. Moore frankly told the spirit photographer he knew it to be a humbug, and proceeded to describe to him precisely what he did.

“Briefly, it is this:—He would take a transparency—i.e., a positive picture on glass—sensitize a plate, and place the transparency upon it, just kept from touching it by minute strips of pasteboard. Then, by means of the light of a gas-jet, he would project a faint dull image of the transparency upon the plate, then prepare the latter in the usual way, and place it in the bath for use. When any person desires a spirit-picture he shows them a clear, unused glass, which he proceeds to prepare chemically, and drop into the bath, but into another compartment from that in which the spirit negatives repose, the two lying so close together that only the very sharpest observation could pos-

sibly detect the fact. The glass he takes out of the bath and puts into the camera is, of course, that on which the ‘spirit’ is already projected, and when it is produced the sitter sees the phantom likeness beside his own, and, if he is a believer, finds no difficulty in recognizing it for that of some beloved one gone before. When Mr. Moore made his trial, the photographer had evidently two plates, and no more, prepared; if he had relaxed his attention and left the artist alone a minute, that would have sufficed to get another plate ready, for, as Mr. Moore has shown us, the light of a match is enough to develop a spirit picture to a sufficient distinctness.

“Before Mr. Moore had expressed his opinion on the matter, the gentleman had been induced to give his views on this spirit work. He is a tall, lantern-jawed, gaunt Yankee, of the down-East type, and, as he stood at the camera during the sitting, he held his head down and drew ever and anon a long, deep breath. On inquiry, he explained that a singular sort of feeling always possessed him at these times, he supposed from the presence of the spirits. Mr. Moore inquired how it was that, when the shadow on the subject was on the right side, the shadow on the spirit form should appear on the left. Well, the spirit photographer said, some thought the spirit stood beside the subject, but his belief was that the spirit gathered itself into the camera in minute particles, and ‘impinged’ upon the sensitive plate. Mr. Moore complimented him on the word ‘impinge,’ as remarkably expressive, but pressed his inquiry, and it was further explained that the spirits don't need light, as the mortal sitter does, but bring their own light, which was supposed to account for the erratic position of the shadows.

“When the whole of this fraud was laid open, and the spirit photo. found that he had been ‘taken in and done for’ by an expert in photography, he was probably as mad a man as ever made money out of the credulity of his fellows. His anger, however, was quite unavailing. The Spiritualists who had believed in him were as mad as he was, and he was compelled at once to cancel his engagement with the Lake Pleasant managers on penalty of being prosecuted as a cheat—a fate which may possibly overtake him yet. The *Banner of Light*, which, since the healthy example of the *Spiritualist Scientist*, and the death of its long-time editor, has taken to exposing fraudulent mediums of all sorts, will print an account of this exposure, and the spirit photographer will have to give up his remunerative business.

“The Moores, by the way, who are among the most accomplished photographers of the country, are also experts in ‘spiritual’ pictures, having made them in many different ways, and knowing very nearly every trick that it is possible to play with the chemicals, camera, and dark-room. This is not the first time that they have been instrumental in showing up frauds of this kind, and some of our readers may recall the exposure of one Evans, who, within these two years, made spiritual tin-types in this city. Evans gave no sittings to persons in the form. Spirits were his only game. He received the visitor who wanted the picture of some one ‘gone before,’ in a dark parlour containing a spirit-charmed camera. He went into a dark room and prepared a plate, which he placed in the camera. A black velvet pall was thrown over it. The seeker after a spirit likeness was directed to lay one hand upon the camera, while the medium laid one of his on the other side. In solemn silence the process of photographing the spirit went on. After some minutes Evans arose and went into the dark room. Then he fetched out the picture, always very dim, but interesting to the visitor. Now, the way he did it was extremely simple. He had an assortment of transparencies which, to avoid the chance of discovery, he carried in his pockets. He ascertained ingeniously, if he could, what sort of a presence the visitor expected, and turned out a child, a young woman, or some aged person, in accordance with the expectation. If it was

not quite satisfactory, he would talk of the changes and developments of the spirit world. But in all cases the pictures were taken by the same means—a brief exposure to light, such as a match would give, of the sensitized plate. How this thing was discovered by the Moores, and how the spirit photographer was found drunk at an up-town hotel, and compelled to leave town on a midnight train, is an interesting *dénouement*. He begged hard to take his camera, which he said was charmed, and which he couldn't replace in a year; but the indignant patron whom he had deceived wouldn't yield a whit, and still retains that magic camera and its velvet pall."

ROYAL CORNWALL POLYTECHNIC.—FALMOUTH PHOTOGRAPHIC SOCIETY.

THE Judges in the Photographic Department express regret to observe a falling off in regard to the number of exhibits this year. It may be attributed to the run of unfavourable weather that we have had in England for the past twelve months, which has been very much against landscape photography and all out-door operations. But at the same time there is a very important feature in the present exhibition that must not be overlooked, and that is the great skill that has been displayed, both as regards artistic feeling and perfect manipulation, which will at all times more than compensate for any falling off in numbers. Some of the productions this year are truly marvellous, and of the highest possible order, in both the professional and amateur sections.

The first in the catalogue was a very large composition picture, "When the day's work is done" (by H. P. Robinson, of Tunbridge Wells, being the finest we have ever seen exhibited by that gentleman), which has been awarded a first silver medal.

Messrs. Frith and Co., of Reigate, send some very charming productions of large size (about twenty by eighteen); the best is Trinity Chapel, Canterbury Cathedral, with the tomb of Henry IV., contrasting very forcibly with the generality of interiors even of smaller size, frequently very heavy through under-exposure; this one in particular is quite free from that fault; it is very soft, and at the same time brilliant and free from blemishes of any kind. To this picture has been awarded a first silver medal. This firm also send some others of subjects of local interest, and some Swiss scenery, which is very fine.

Mr. Reuben Mitchell has been awarded a first silver for a very clever artistic picture, "A Lancashire Mill Pool"—being very soft and brilliant.

Mr. F. Palmer sends some good illustrations of Swiss scenery.

Mr. E. Forhead sends four pictures. The best is a study of plants and flowers; the others are landscape subjects, possessing several good qualities.

Mr. J. Millman Brown contributes some very good studies; his best—the "Valley of Bonchurch, Isle of Wight"—has been awarded a first bronze medal.

Mr. G. H. Dew sends some good pictures of Stoneleigh Deer Park. The subjects are well chosen, but are somewhat over-toned, and do not do the negatives fair justice.

In the portrait department, Mr. G. Nesbitt, of Bourne-mouth, exhibits a very fine collection of portraits. A first silver medal was awarded for No. 640, a portrait study.

Mr. W. Gillard receives a first bronze medal for the study of a head.

Mr. B. Wyles sends several productions, of which we cannot speak very highly, owing to the careless way in which certain manipulations have been conducted.

Mr. S. Fry exhibits three composition pictures. The one of the Taxidermist is the best.

Mr. W. M. Harrison, of Falmouth, sends an enlargement of a group of children in carbon, which is very fine. To this has been awarded a special bronze medal.

Mr. Faulkner, of London, sends some of his well known

exquisite work. Owing to their late arrival they could not be entered for competition, which we very much regret. His "Dorothy" and "Simplicity" are perfect masterpieces of art, which have been reviewed by the London press, and of which we cannot speak too highly.

AMATEUR SECTION.

The exhibits in this department are far above the average. Mr. E. Brightman carries off the palm for his gems, the "Views on the Lynn," which remind us of the work of that eminent amateur, Mr. Russell Manners Gordon, and we think being equal, which is saying a great deal. A first silver medal has been awarded to him.

Following very closely are some productions of Mr. H. Manfield, of Northampton, which are but very little inferior to those of the last exhibitor; a first bronze medal has been awarded to No. 770, "In the Fern Glen."

The productions this year of Mr. F. M. Brownrigg, we think, do not do him justice, having seen work of his that we like better.

Mr. F. Beasley, junr., came out very strong this year, which shows that he is a very painstaking worker. We have examples by him of several processes. His rendering of (No. 723) "Ivy Bridge, Devonshire," by the collodio-emulsion process, is very fine, and has been awarded a first bronze medal. We must not omit to notice the productions of J. D. Radcliffe, which although small in size, are by no means insignificant. "Going on an Errand" and "A Quiet Nook" are perfect little gems in their way.

Mr. H. M. White exhibited some work stated to be photo-ceramics. We fail to see what part photography has played in these productions, and therefore we withhold our judgment.

The judges of the photographic department were Messrs. Wm. Brooks, Carne, and Lanyon.

PICTURE FRAMES AND THEIR MANUFACTURE

[MANY of our readers, especially those residing in the provinces, may find it convenient to know something of the manufacture of picture-frames. A few suitable tools, in the hand of a man having some facility in using them, will often improvise a useful frame, especially as excellent mouldings can be purchased ready for use. We extract the following instructions from the *Carver and Gilder's Guide*.]

"In the first place allow us to remark that without a good edge on your tools, you must not expect to produce good work. Try, not how much, but how well, you can do the work in hand, when, with practice, you will find that you will not only do it well, but get over a considerable amount in a short time.

"You will have many kinds of wood offered you to work on, and it will be expected that you will be able to make as good work with the hard woods as with the soft, and sometimes you may not succeed as well as you may wish, but oftentimes difficulties are overcome which at first seem insurmountable.

"As in many other things—making mouldings, mitreing up, mounting pictures, cutting glass, &c., requires care as well as skill, and a careless workman will spoil as much material and waste as much time as he is worth; therefore, make it a rule to be as careful as possible under all circumstances, when you will not have to reproach yourself, if an accident occurs, with carelessness.

"*Tools Required*.—The tools required by the picture-frame maker may soon be enumerated.

"*Mitre Block*.—This block is made to guide the saw in cutting up mouldings. It consists of a thick piece of wood glued on a good bottom, with saw cuts in it at an angle of forty-five degrees, so that the moulding, when cut off, will form a square frame. Eighteen inches long will be found a convenient length. See Fig. 1.

"Shooting Board.—This board is made with a ledge screwed on at an angle of forty-five degrees, and a flat run

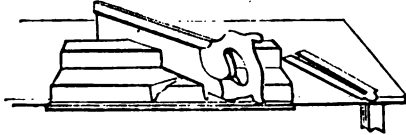


Fig. 1.

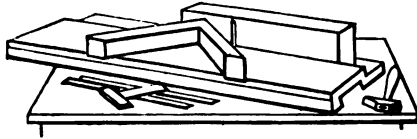


Fig. 2.

for the plane laid on its side. The use of the shooting board is to 'shoot' or plane the ends of the mouldings to bring the mitres close together. See Fig. 2.

"Shooting Planes.—Planes about fifteen inches long, and three and a-quarter wide, without handles, the plane iron without a guard, used for shooting the ends of the mouldings on the shooting board.

"Saws.—Those used for cutting up mouldings are called tenon or back saws, and are supported at the back by a piece of brass or iron, to prevent the thin blade of the saw from bending.

"Hammers, various sizes, and not too heavy.

"Chisels, different widths, *Brad-awls* and *Gimlets*, various sizes.

"Turnscrews, large and small.

"In addition to which a few small tools, such as pincers, scissors, punches, squares, &c.

"There must also be cut brads, from half-an-inch to three inches long, picture rings of all sizes, nails, screws, &c.

"Glue is also used, and as its strength is dependent upon quality, we will give a little information upon the subject, as the strength of the work is only secured by a good article.

"Glue.—Glue, an inspissated animal jelly or gelatine, is principally prepared from the parings and waste pieces of hides and skins, the refuse of tanneries, and the tendons and other offal of slaughter-houses. These should be carefully preserved from damp, being very liable to decomposition. When required for use they should be steeped for about fourteen days in slaked lime mixed with water, and then drained and dried. Before being converted into glue, the materials are generally steeped in weak milk of lime, well rinsed in water, and exposed to the air for twenty-four hours. After this they are placed in a copper boiler, two-thirds filled with water, and furnished with a false bottom, perforated so as to prevent them from burning, and as much piled on as will fill the vessel. Boiling is continued until the liquor, on cooling, forms a firm gelatinous mass. The clear portion is then run off into another vessel, where it is kept heated by means of a water-bath, and allowed to repose for some hours to deposit, when it is run into the congealing boxes, and placed in a cool situation. The next morning the cold gelatinous masses are turned out upon boards, wetted with water, and are cut horizontally into thin cakes with a stretched piece of brass wire, and then into smaller cakes with a moistened knife. These cakes are next placed upon nettings to dry, after which they are dipped one by one into hot water, and slightly rubbed with a brush wetted with boiling water, to give them a gloss; they are lastly stove-dried for sale. During this time the undissolved portion of skins, &c., left in the copper is heated with fresh water, and the whole operation is repeated again and again, as long as any gelatinous matter can be extracted. The first runnings produce the palest and best glue. In applying glue, the hotter the glue the

more force will it exert in keeping the united parts together; it should therefore be applied immediately after boiling. Glue loses much of its strength by frequent re-melting. (Glue should be purchased in dry weather, for that which is then soft is not of so good a quality as that which is crisp. The most transparent is the best. Good glue, if immersed in water for two or three days, will not dissolve, but swell; if of inferior quality it will partly or wholly dissolve. Again, that glue is the best which, being dissolved in water by heat, may be drawn into the thinnest filament, and does not drop from the brush as oil or water, but when falling extends itself into threads. Glue made from the skins of old animals is much stronger than that of young ones.

(To be continued.)

Correspondence.

REFLECTED LIGHT FOR SHORTENING EXPOSURES.

SIR,—Will you or some of your numerous correspondents inform me for what reason stops in lenses are black; why not have them white? Accident usually leads to many discoveries and improvements. I do not suppose what I am about to relate has never been adopted before in an emergency; but still I think what I am about to describe is very suggestive. I had set my mind on photographing a very beautiful subject, which was varied with water, trees, and with dark masses of foliage, scrub, ferns, tall grass, in the foreground—the make-up of a very fine picture. The difficulty was to get a still day. A fine morning tempted me to make the attempt; but, as usual, the gloom came on before I had fixed my camera. I waited patiently for more than an hour; the light improved, but when a gleam of sun shine appeared, the wind disturbed the foliage. At last a lull in the breeze came, but no sun. I took off the cap; but in about two minutes the wind put a stop to all further exposure, so I put up my instruments and left. As my plates are large (18 by 16 inches), I did not expect to have more than an outline of a picture; but on developing I had a good one in parts—water, foreground, and distance all well defined, full of detail; but the trees were faulty in the shadows, so I determined to try again on the first favourable opportunity, which soon occurred. This time all was sunshine, with a white cloud in front of the camera, so I concluded ten minutes would be ample time to get a fully exposed picture; but, to my astonishment, when I had developed my plate, it was as much under-exposed as my former plate, with two minutes in a gloomy light.

The same day I made a journey of twelve miles to photograph a long and smoke-begrimed building in the centre of a large town. When I had my camera fixed, I found I had forgotten my case of stops; to return for them was out of the question, so having a large business card with letter press on both sides, I cut it to the size and shape for a stop, then cut a jagged hole, three-fourths of an inch in diameter, in the centre, placed the card in the space for the stops, exposed ten minutes in the sun, and a second plate about five minutes. Arriving at home, I was anxious to test my plates. They were clean, and full of detail, when developed. This little incident rather shook my faith in black stops.

But to return to my charming spot of previous failures. Another favourable day came, which enabled me to make a third attempt, which was very successful. I exposed my first plate with a black stop, and to be quite sure of having a fully exposed picture I gave it forty-five minutes, and without moving the camera a second plate, with my before-named white card stop, fifteen minutes. Both plates were good; but the second is very superior, being full of fine detail in both the light and shadowed parts of the picture. The lens I used is Dallmeyer's patent rectilinear, with the small stop (three-quarters of an inch in diameter).

RUBEN MITCHELL.

Talk in the Studio.

PHOTOGRAPHING INTERIORS BY MAGNETUM LIGHT.—We have received from Messrs. Barony and Co. some very good photographs of the interior of Scarborough Aquarium. Few tasks could be more difficult to attempt, both on the score of darkness and the nature of the subjects, but the difficulties have been fairly combated, and the results are good.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—During the meeting of the Society in Falmouth, this year, a lecture was delivered in the Polytechnic Hall, on "Photography," by Mr. Brooks, one of the vice-presidents of the South London Photographic Society, Mr. N. Carne in the chair. The object of the lecture was mainly to introduce and explain the most recent inventions in the photographic art, both in the camera and lenses and the photographer's stand, and the chemicals necessary for the preparation of plates, as well as an entirely new apparatus for the generation of oxygen gas. The camera was remarkable for its compactness and adjustments, while its simplicity in packing and its strength would have been recommendations in its favour even were it not that by means of it photographs, whether landscape or otherwise, could be taken with greater facility and free from the distortion owing to the nature of the adjustments of most cameras in use. The lecturer then explained what is known as the emulsion process; that was, the nitrate of silver and the bromides were mixed with the collodion, and so doing away with the nitrate of silver bath. The plates could, therefore, be used either moist or dry, and their long-keeping qualities, both before and after exposure, were much improved. The negatives produced by this process were not only finer, but did not give those violent contrasts sometimes seen in the ordinary wet process with the bath. Mr. Brooks dissolved his pyroxylene, added bromide and silver, and prepared an emulsion in presence of the audience, and subsequently exhibited negatives and transparencies on the screen to the great delight of the audience.

COLORING BORAX VARNISHES.—It is well known that an aqueous solution of borax is able to dissolve shellac, forming a kind of varnish to which any desired color can be imparted by mixing with pigments. Major Dr. Kahl, of Dresden, has communicated to the Dresden branch of the Saxon Society of Engineers the results of a large series of experiments made with these varnishes. He reports that they are very cheap, and dry very quickly, but they scale off from wood too easily. When this varnish is colored black with India ink and applied to paper, it possesses a fine gloss; but other colors, especially carmine, when mixed with this solution, acquire an impure shade, and many pigments cement together in this solution, forming a hard and totally useless mass. The black shoe polish sold for ladies' boots is often made by adding some black pigment to this shellac solution. For bronze boots, roseanilin may be dissolved in any alcohol varnish. —*Scientific American.*

To Correspondents.

FEARLISTED.—The case you describe is very annoying indeed, there can be no doubt, and also very unfair, but we do not see any simple remedy. How far you may have a remedy at law we cannot say, as that is a question for a lawyer. We cannot undertake to give an opinion upon whether the offender is, or is not, actionable.

W. B. B.—The method of making a photograph transparent, and colouring it at the back, is very old, and has often been described in our pages. The modification of this method, which has recently been revived in America under the name of *Photochrome*, has been described in our pages within the last few months. We have not heard of its recent introduction into this country. It has not been patented, nor do we see that it could be, inasmuch as the method under various modifications has been practised and even patented in this country many years back.

HARLOT.—It is very difficult to dissolve silver in alcohol unless you go the right way to work. By adopting the following plan we have found no difficulty. Take the proper quantity of nitrate and bruise it to powder in a Wedgwood mortar. Then add a little alcohol, and pound the silver with it into a creamy paste. Add a little more alcohol, and again pound. Then pour off as much as you can of the clear solution, add a little more alcohol, and again pound, and so until the whole is dissolved. If you are using strong alcohol, at all near to absolute, you may add to the mixture in the mortar a few drops of distilled water. We have generally succeeded in this way, without any boiling of the solution, although, of course, a little heat aids the operation of solution.

W. REYNOLDS.—We presume that you mean a collodion transparency, although you do not say so. To aid in transferring a collodion transparency to paper, it is desirable that the glass should be waxed. A piece of good plate glass should be used for taking the transparency upon; and if it be thoroughly well cleaned the film will leave it without difficulty. Treating the plate with wax is, however, an aid. Place a piece of pure bees-wax in ether, which will dissolve a portion of it. Pour a little of this on the well cleaned plate, and then polish it off, leaving none, apparently on the surface. The film will, as a rule, leave glass so treated without any difficulty. There have been various articles in the *News* and *Year-Books* on the subject. Articles on enamelling prints will also give you the information. The only method we can suggest for securing a sale for the printing-frames is to advertise them in the *News*.

B. A.—There are publishers of photographs in London through whom photographers wishing to sell to the public generally distribute their works. The largest publishers in this way are Marles & Co., Bohe Square. Apply to them with specimens of the work.

JOHN SMITH.—The horny repellent character of your collodion film is the sole cause of the trouble, and we fear that you cannot effectually get rid of the trouble without getting rid of that repellent film. There are various ways of doing this. The legitimate method, unfortunately, is not always available. It consists in using the collodion older and ripier. The same collodion with age will be all right. If you have none ripe enough, perhaps you have a little of an old and somewhat powdery or rotten sample, which, added to that in use, will modify it. The addition of a drop or two of distilled water to each ounce, and shaking well, is often an improvement. Failing the adoption of these methods, there are other palliatives. Reducing the strength of the bath will do something. Plunging the plate in the bath before it is too much set is also useful. Re-dipping the plate after exposure is sometimes a remedy. But if the bath be acid, this is dangerous, as it sometimes injures the image. In some cases the addition of glycerine to the bath answers; but we do not like additions to the bath, which often involve risk.

SEVER.—If we were building a studio we should adopt the old-fashioned oblong rectangular building with ridge-roof. Glass in roof and sides to within about six feet at each end, which portions, as well as the ends, should be opaque. We should have the largest portion of glass in the north side, but should not entirely exclude it from the south, which could be kept covered with blinds in sunny weather. But as so much dull weather prevails in this country, we should have south light available when necessary.

HOW.—Nelson's gelatine is generally used. A special quality for photographic purposes is prepared by Nelson. 2. We do not clearly understand what you mean by the "best transfer paper for drawing or sketching, to be copied on sensitive paper." Do you wish to use the drawing as a negative from which to print on sensitive paper? If so, you will see that the fact of its transparency interposes a difficulty in using it as a negative unless you make the portions to print white very opaque by using a dense pigment in drawing. Good tracing paper or tracing cloth is the best transparent material for drawing on. A tube of orange chrome, as sold by artists' colourmen for use in oil painting, added to a few ounces of spirit varnish, will make a good non-effluvia varnish for drawing negatives on glass with an etching point. Bates' black varnish will also answer well.

W. A. NICHOLAS.—It shall appear in *Year-Book* in due time, and in the *News* at once.

J. HENRY WHITEHOUSE.—Many thanks for interesting experience with emulsion, and also for charming prints from coffee plates. The fresh view of Chillon is very interesting. Your success with coffee plates scarcely becomes a fair ground of comparison, perhaps, with the emulsion, as we have rarely seen results even with wet plates, from the most skilled hands, which would compare favourably with them. We are anticipating with pleasure your formerly promised hints on "Boudoir Photography," which we some time ago promised to our readers.

W. PARRY.—No prints have arrived. Your project is, we think, a good one, and ought to command success.

A. SCHOFIELD.—We may say at the outset, in general terms, that your work is very good for a beginner. There is room for improvement in the lighting in some cases. No. 2 is best in this respect. A direct light a little to one side is generally most effective, and a general diffused light is least satisfactory. The exposure is generally about right, but there is in some cases a slight tendency to over-exposure. As a rule, they are sharp enough. Examine good work whenever you see it, and study the posing and lighting.

W. B. DINNIE.—The only cause to which, from their appearance, we should attribute the spots, is the particles of bronze from coiled gold printing on cards. Can you find any trace of such printing on the other cards amongst which these have been kept? We see no reason to suppose that they are due to any fault in the manipulation, the paper, or the starch.

Several Correspondents in our next.

The Photographic News, September 14, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE USE MADE OF PHOTOGRAPHY BY CONVICTS AND BY COURTS—TRANSPORT OF COLLODION—POPULAR ESTIMATE OF A PHOTOGRAPHER'S ABILITIES.

The Use made of Photography by Convicts and by Courts.—We have several times pointed out in these columns the important post which it behoves photography to fill in connection with legal matters. No copyist can be so precise, no draughtsman so exact, as the camera when it comes to making a *fac simile* of a document or sketch, and to us it is simply astounding that after all these years our law and police courts should not have made more use of photography. A month or two back we published a very interesting account of the way in which they manage these things in France, or rather in Paris; the use to which the French police is putting photography is day by day becoming greater, but with us it is not often that we hear of photographs of documents being offered as evidence. And yet we pride ourselves a good deal upon the thoroughness of our trials, and upon the accuracy of evidence. It is, we repeat, almost inconceivable why the use of the camera is not more frequently resorted to. Take, for instance, the present *cause celebre* concerning the detectives and the Turf frauds. How many times have the counsel for the prisoners asked to be furnished with such and such documents, and the prosecution promised copies, which are, we suppose, to be made by some clerk or official in the Treasury? Will not copies made like this be well-nigh useless one way or the other? In most instances it is a question, in these documents, not of the words, but how they are written, and whether they are in the handwriting of one or the other of the prisoners. Now it is just as easy to identify writing from a photograph of a document as from the original itself, and we have no doubt that experts such as M. Chabot would have as little hesitation in pronouncing an opinion upon one as upon the other. When a document is stated in evidence to be in the handwriting of an accused person, it is of small avail for the legal adviser of that person to have placed in his hands a pen-and-ink copy of the document. If he has not the original to deal with, or a photograph of it, there is little use of his having anything at all. Again, as the identity or non-identity of writing is, after all, a matter upon which everybody is in a position to form an opinion, it seems to us that when such a point involves a serious charge, the jury should have every facility given them to form a judgment of their own, independent of that offered by an expert in the witness-box. This opportunity they could enjoy one and all, were photographic prints at hand of the document under dispute, prints which would demonstrate every up-and-down stroke of the writing, every chance or uncertain mark of the pen. The cost of preparing photographic records of this kind, especially if the Treasury possessed a photographic establishment of its own, would be simply nominal. With a copy in the hands of the judge, the counsel, and the members of the jury, there would be no occasion for passing the document from one hand to another, no chance of its being lost or mislaid. "I believe," said one of the witnesses in the trial to which we have just alluded, "that this document is in the handwriting of the accused, but from that word to this word the writing is in a feigned hand." Such a statement leads, of course, to a constant passing to and fro of the important paper, and yet it is impossible for any one under such circumstances to examine and criticise the opinion given with proper care and deliberation. And while on this subject, we cannot help remarking that while the law is so slow, apparently, in making use of photography in this connection, those engaged in the Turf frauds, Messrs. Kurr, Benson, and Co., seem to have been quite alive to the value of the art.

Several times during the examination of these convicts did it transpire that communications received from the detectives implicated, if returned to the latter, were first of all photographed, so that the swindlers always retained in their possession sufficient to prove what letters had passed between the parties. The convict Kurr, when he returned a letter, retained a photographic copy of it, in order, as he said, that he should still hold some check over his former friends. We certainly have not as yet exhausted the applications of photography in connection with the production of *fac simile* results, and certainly it is in making copies of handwriting for verification wherein lies one of the most valuable uses to which the camera can be put in a court of law.

Transport of Collodion.—The German photographers are calling out—and with some reason, apparently—on the subject of the transport of collodion. They say that all sorts of explosives are suffered to be carried by sea and land; and why, they ask, should not this universal requisite of photographers be conveyed in like manner? Not only is it permitted to transport gunpowder and rockets, but dynamite and gun-cotton even, the principle of collodion, will be received by railway companies and carriers who object, however, to have the same material in the form of a liquid upon their premises. Or, rather, it is not the companies, so much as Government that objects. With us pretty well the same difficulty is met with, although in not so exaggerated a degree. In this country, certain companies refuse to have anything to do with gun-cotton, and therefore the absurdity of the comparison falls away. But collodion is everywhere regarded with such distrust that it is only under much protest that it can be shipped or conveyed by rail in England. Manufacturers have for some time past complained of the strict and almost impossible conditions that have to be fulfilled in sending collodion from one place to another, and many have been the petitions and prayers made upon the subject to those in authority. We are therefore in a fair position to sympathize with our German brethren, who seem to experience a difficulty in getting this important product carried about at all. We can only wish them a speedy release from their ills, and hope that Government, by reason of the comparatively small quantities that are usually transmitted, will see fit to extend such privileges, at any rate, as are enjoyed in connection with the transport of dangerous explosives.

Popular Estimate of a Photographer's Abilities.—A landscape painter wrote us the other day a very frank note. He had a difficulty in getting figures now and then for a foreground, and thought that if he had a camera to secure some of the rustic beauties he met from time to time, such photographs would come in handily for the purpose. Was there much trouble in taking photographs, he asked, and could anyone who knew anything at all about the matter secure good pictures? His idea, like that of many other people, is that the camera is a sort of machine, of which the handle has to be turned; and, if you have only the strength to do this, cabinets and cartes, as the case may be, fall out at the other end. Our answer was, of course, very simple. It was that photographs can undoubtedly be secured by anybody after an hour or so of tuition; but that, like most other pursuits, he who knew most about it secured the best results. If he wanted simply outlines and nothing more, there was no necessity for him to learn much; but if he desired to take rustic pictures like a Rejlander or a Robinson, then there was a good deal still before him. We quote the matter as an another instance of the estimation in which some people hold a photographer's abilities.

COLOURED MINIATURES ON CONVEX GLASSES.

A STYLE of portrait which has attracted much attention in America under different names, as *Photochrome*, *Oil Photo-Miniature*, &c., is described by Messrs. Rice and Thompson,

of Chicago. Some of our readers have recently asked for details, and although an account of these pictures appeared in our pages some time ago, we think it may interest some of our readers if we repeat the details as given by the firm in question in the *Photographic Times*. The details are as follow:—

If the print you desire to use for the miniature is mounted, place it in clear water, leaving it immersed until it separates from the card. Having your unmounted print ready, cut it a little smaller than the convex glass you are to mount it on. You will have prepared in a convenient vessel a little thin starch paste. Have your convex glass perfectly clean; wet the print, and then blot off the surplus water; paste the face of the print with the starch preparation, also covering the concave or hollow side of the glass with the same, using great care to work the paste smooth, both on the print and glass; lay the print on the glass, the prepared surfaces together, and proceed carefully to work the bubbles out with the fingers, after which lay two or three thicknesses of some soft, tough paper on the print, and with an ivory paper-knife, or flat stick, with curve about the same as the concave surface of the glass, work the print down to the glass, forcing out all the air; work from the centre of the glass toward the edges, and with great care, using very light pressure to avoid breaking the glass. The mounting of the print should be done quickly, as the paste dries very fast. When perfectly dry pour on a little castor oil, taking a small piece of fine sponge, and gently rub the oil over the whole of the surface of the print. Use oil freely, in order to saturate the paper; when perfectly translucent, take a small piece of fine sponge and wipe off the surplus oil. Your picture is now ready to apply the colour to the eyes, which is the only part of the work done directly on the print. Having coloured the eyes, take some narrow strips of thin cardboard, and with the mucilage paste the strips on the concave surface, as near the edge as possible; this is to keep the two glasses separate, and prevent the spots which frequently occur when the second glass is laid directly upon the oiled print. Having the strips of cardboard set, take another convex glass, perfectly clean, the same size as the one having the print; place the two together, putting the convex surface of the second glass into the concave surface of the one having the print attached. This clear glass, when in place, receives the colour for hair, complexion, drapery, and background. The colour can be removed wholly, or in part, from the glass on applying a little turpentine with a cloth. Any mistake in laying the colour can be easily and quickly corrected as above. Having applied the colour, back up with a piece of card, and with some strips of the adhesive paper, moistened *a la* postage stamp, or with a brush dipped in clean water, bind glasses and back together, and miniature is ready for framing.

OIL COLOURING FOR PHOTO-MINIATURE.

Eyes.—The colour for the eyes is applied directly upon the prepared photograph; use brush No. 3. Blue eyes, use Prussian blue mixed with a little ivory black. Brown eyes, use Vandyke brown. Grey or hazel eyes, Prussian blue mixed with Vandyke brown and silver white.

The colour for flesh, hair, drapery, and background is applied to the concave surface of the clear glass, which is placed over the mounted print.

Flesh.—Use vermilion, silver white, and chrome yellow, mixed to suit. For children, use rose madder or carmine in place of vermilion. For dark complexion dull the colour by adding Vandyke brown.

Hair.—For blonde hair, use half yellow ochre and Vandyke brown. For lights, use Naples yellow. Brown hair, Vandyke brown. Black hair, ivory black, silver white, adding a little Prussian blue. For grey hair use silver white, Naples yellow, black, and a little Prussian blue.

Drapery.—Whatever colour suits.

Background.—Your own judgment will suggest the proper colour to use.

To change the work in any way, take a small piece of cloth, dipped in turpentine, and remove the colour.

TO PREPARE STARCH PASTE.

Take a heaping spoonful of the starch, put into two ounces of cold water, in a tin-cup. Stir until dissolved, then bring to a boil, stirring constantly. If too thick, add boiling water."

FRENCH CORRESPONDENCE.

THE PHOTOGRAPHIC ARCHÆOLOGICAL SOCIETY OF FRANCE—ITS EXHIBITION AT HAVRE—ON PREPARATORY FILMS—THE ADVANTAGES OF ALBUMEN AND RUBBER SOLUTIONS FOR ACID AND ALKALINE DEVELOPMENT.

ON the occasion of the Congress of the Association for the Advancement of Science, which has just been held at Havre, the French Archæological and Historical Society, which busies itself with the preservation of photographic record of monuments, &c., conceived the happy idea of instituting an exhibition. The Society I speak of was founded in 1876, although many of its members have individually for some time past occupied themselves with the objects of the body. On the present occasion the Society desired to show visitors coming from all parts of Europe not only pictures of some of the more interesting monuments about the country, but also to show how far photography helps to record such objects, and how useful it is also to the archæologist, the geologist, the geographer, and the astronomer. The interesting collection of photographs to which I refer included very many remarkable works, taken in most instances by clever provincial photographers. Among those who made excellent contributions were MM. Letellier at Caccia, of Havre; Miesement, of Blois; Blondel, of Lille; Odinet, of Nancy. Besides pictures of monuments, &c., there was also a fine collection of micro-photographs of the plant and insect world contributed by M. Albert Marguery, of Rouen, which was very much admired.

M. Boivin sends me an important communication upon the subject of preliminary films to be employed in the preparation of dry plates. Among the advantages possessed by these films, according to M. Boivin, is the fact that by their use operators may dispense with the most troublesome manipulations connected with the polishing and cleaning of glass plates. The film prevents, in a word, the image formed upon the plate from coming into contact with any injurious substances that may be upon the surface of the glass. Moreover, such a film ensures the adherence of the collodion to the plate, and prevents any air-bubbles or rising of the collodion film. Of all the formulæ which have been recommended for the composition of preliminary films, M. Boivin considers that only very dilute aqueous solutions, and those containing rubber dissolved in benzole, are capable of practical employment. But he hesitates to say which is the better kind. Each has its advantages and its defects. Nevertheless, my friend assures me that rubber is indispensable when resort is had to alkaline development; on the other hand, albumen is to be preferred for acid development.

In general, the operation of acid development is an easier one to accomplish upon an albumenized plate than upon one coated with rubber solution. Of this one can easily convince oneself by covering the two halves of a plate with films of a different nature. Here are the formulæ which M. Boivin has adopted for securing both films of rubber and albumen. In preparing the latter he takes of—

Albumen	...	30 cubic centimetres
Water	...	20 "
Acetic acid	...	1 cubic centimetre.

The acidulated water is poured into the albumen by degrees, and slowly agitating the mixture the while, with a glass rod; then two hundred cubic centimetre further of water are added, and, finally, the whole is allowed to rest for some hours. The liquid is afterward

decanted, the clear part being further filtered through a sponge or bit of fine muslin, and then through paper, when it will be found to be of a most liquid character. The albumen solution treated in this manner may be preserved for a long time; the glass plates are covered with it as in the ordinary way. A glass may be used to aid in the coating, care being, of course, taken to prevent the formation of air-bubbles. As soon as the film has dried completely, the plate is put away with others in a grooved box ready for use at any time. If the albumen is employed in a concentrated condition it will give rise to syrupy streaks over the surface of the plate; it is for this reason that M. Boivin recommends a very dilute solution. As to the rubber varnish, M. Boivin assures me that the best preparation is as follows:—

India-rubber	...	0.2 to 3 decigrammes
Pure benzole	...	100 cub. cents.

The solution is allowed to remain for a few days in a warm locality, and is then filtered through paper. To facilitate dissolution of the rubber, it may be moistened first with chloroform or ether some hours before plunging it into the benzole. The pear-shaped masses of rubber, to be purchased of druggists, is the material that should be used; that in sheets or in tubes will not dissolve. The benzole should be rectified, and exempt from all fatty matter. When the film of rubber has been applied to the surface of the glass plate it should be dried at a good heat; the sooner it dries the less liable is it to crack, but this defect is not to be avoided if the rubber solution is a strong one. M. Boivin recommends the addition of a few centigrammes of gayac resin to the solution. If the latter becomes turbid, it may at any time be clarified with a little fused chloride of calcium, which absorbs the water that is the cause of turbidity; the chloride of calcium will afterwards remain behind upon the filter, being insoluble in benzole.

M. Boivin has sent me an exquisite picture obtained by means of a dry plate prepared on a very simple method, of which he has promised me the description in an early letter; I need hardly say that I shall hasten to communicate the details to the readers of the PHOTOGRAPHIC NEWS.

ERNEST LACAN.

DR. LIESEGANG ON EMULSION NEGATIVES WITHOUT GLASS.*

THE important progress which has been made of late in emulsion processes goes hand in hand with M. Warnerke's sensitive paper films. Of the latter process we have already placed details before our readers. The emulsion is the same as that ordinarily used upon glass plates, but some not unimportant improvements have been made in the material by the use of papyroxyl. Instead of the chalk paper previously used by Warnerke, a strongly-sized paper is substituted as basis for the collodion; for this reason the film negative will not have both sides glazed as formerly, but one will be matt, a detail, however, which will have no influence upon the negative itself.

The paper, as our readers are aware, is alternately covered with rubber solution and collodion several times, and finally coated with bromide of silver, collodion, or emulsion. This sensitized paper is cut to the proper size to go in the dark slide, and pieces are laid upon one another, each with a sheet of orange paper between, and the whole packet enveloped in tin-foil, so as to keep good for some time.

Practical arrangements for changing sensitized paper out of doors, without a dark tent, were invented twenty years ago; their light metal frames with card-board back, upon which the paper was fastened, was one of these arrangements. Over the frame was slipped a cardboard envelope, and the whole put into the dark slide, which was provided with a slit in the side. The dark slide was adjusted, the cardboard envelope drawn out, the lens was uncapped, the envelope again pushed into the slit, and the time of expo-

sure noted, &c. As the frames were light and unbreakable, and required no care in packing, like glass plates, a large number of them, filled with sensitive paper, could be taken about by a photographer. Other, and perhaps better, arrangements could no doubt be suggested. The old arrangement of the Sutton panoramic camera, which had two rollers for unrolling and rolling up of the paper as exposed, would answer; at any rate, I myself have for the past fifteen years employed the system with waxed paper, and found it exceedingly convenient. If there is a dark room handy, the first of the sheets in the tin-foil case is torn off, and, this film having been put away, the case is replaced in the dark slide, taking care that the spring of the latter is not too strong, and does not act so as to bend the packets. The films, as exposed, are put away between yellow paper. Those who prefer to expose the sensitized paper through a glass plate must alter their camera after focussing to the breadth of the plate, so that their picture may be rendered perfectly sharp.

The time of exposure depends, of course, upon the nature of the emulsion that you employ. This material may be produced of a very sensitive nature, but then its development is more difficult; for this reason, it is well at present to employ an emulsion of no very great sensitiveness, which may be developed with certainty. In a good light, to take a landscape view with a rectilinear lens, and full aperture, some twenty to thirty seconds are necessary, and you do well to give rather more, than less, exposure, as a plate which has been over-exposed can be treated successfully with a modified developer, but not so one that has been under-exposed.

The collodion film, whether exposed or un-exposed, must be handled with extreme care and with clean fingers, for a hot or dirty hand leaves marks behind it. Before development, a pin is put under the film to disengage a corner, and then the whole sheet may be pulled off with forefinger and thumb, leaving the yellow paper underneath uninjured. Then upon a glass plate, the same size as the film, you put the latter, having previously moistened the glass with water; you press down the film with filter paper, and so make it lie perfectly smooth and even.

The film is now covered with a mixture of—

Benzole	...	...	...	1 part
Alcohol	...	...	...	10 parts

This is allowed to remain upon the collodion for a couple of minutes in order to soften it, and to prevent the india-rubber from forming spots or patches.

After the film has been exposed and brought back to the laboratory, the development may be conducted in various ways; that is to say, Colonel Stuart Wortley's strong alkaline developer may be employed, a weak alkaline solution, iron, or acid pyrogallol solution and silver.

The strong alkaline developer according to Stuart Wortley's formula is as follows:—

P.—Pyrogallol acid	...	...	10 grammes
Alcohol	...	...	50 "
A.—Carbonate of ammonia	...	...	10 "
Distilled water	...	...	80 "

In this case the ammonia is pounded in a mortar, and mixed with the warm water.

B.—Bromide of potassium	...	...	10 grammes
Water	...	...	160 "

Of these solutions, there is mixed in a glass measure:—

P.	...	...	1 gramme
A.	...	...	12 grammes
B.	...	...	1 gramme

The film is first rinsed with water until it is no longer greasy, and then this mixture is poured upon it. The image at once appears, but when necessary, half as much again of P, A, and B is added. For larger plates, of course, a larger quantity of mixture must be taken. Should the image appear immediately, it is a proof that the film has been too long exposed, and then another gramme of B must be added. Little glass measures are exceedingly useful in undertaking alkaline development.

as in this way one easily accustoms oneself to work with particular quantities.

The weak alkaline developer differs in some degree from that which we have just mentioned, and it should be used for treating the more sensitive films:—

A.—Carbonate of soda ...	10 grammes
Bromide of potassium ...	10 "
Water ...	200 "

Or, instead of the bromide of potassium, half as much bromide of ammonium may be employed.

P.—Pyrogallie acid ...	10 grammes
Alcohol ...	80 "

In applying this developer, you add to twenty-four grammes of water one gramme of P, mix well together, and pour it over the film. The image then appears in all its details. Upon this, the liquid is poured back into the measure, a few drops of it are added, and the image therewith intensified. Or, if preferred, you may pour A over the film first of all, and then add a few drops of P, and, after a few minutes, one or two drops more, when the image increases in intensity.

The iron developer is managed by preparing, in the first place, two solutions; they are:—

A.—Boiled water ...	64 grammes
Citric acid ...	1 "
Nitrate of silver ...	2 "
Copper vitriol (sulphate of copper) ...	8 "

The copper salt is dissolved by itself, and then the silver and acid, having been likewise dissolved, are added. If prepared with boiled water, the developer will hold good a long time.

B.—Sulphate of iron ...	3 grammes
Glacial acetic acid ...	3 "
Water ...	100 "
Or	
Sulphate of iron ...	5 grammes
Water ...	100 "
Methylated spirit ...	5 "

The film is first moistened with water, and then covered with A; this is then poured back into the developing glass, and then a few drops of B are added. The mixture is applied again and again, until all the details come out.

The acid, pyrogallie, and silver developer is undertaken also with two solutions made up as follows:—

A.—Boiled water ...	64 grammes
Citric acid ...	1 gramme
Nitrate of silver ...	2 grammes
Copper vitriol ...	8 "

The copper salt in this case is also dissolved separately.

P.—Pyrogallie acid ...	10 grammes
Alcohol ...	80 "

One gramme of P is put into the glass measure, and twelve grammes of water added to it, and the mixture is then applied to the film, until all the details of the image are developed. Then the solution is poured back into the glass, and a few drops of A are added. With this the negative may be properly intensified. You may proceed also in the reverse order by pouring some of A solution over the film first, and then adding some drops of P.

The fixing of the film is undertaken in the usual manner, either with a two per cent. solution of cyanide of potassium, or an eight per cent. solution of hyposulphite of soda. The process of intensifying may be resumed after fixing, if necessary, as in the case of ordinary wet collodion plates. The film may be intensified by means of Col. Stuart Wortley's process, the following three solutions being made use of:—

C.—Citric acid ...	1 gramme
Water ...	120 grammes
S.—Nitrate of silver ...	3 grammes
Nitric acid... ..	1 gramme
Water ...	100 grammes
P.—Pyrogallie acid ...	10 grammes
Alcohol ...	80 "

A sufficient quantity of C is poured several times over the well washed image, and then for every six parts of C there is added one part of S and P. This mixture will intensify with considerable rapidity, but it is necessary to wash well subsequently, to remove every trace of pyrogallie acid. The film after development may be allowed to remain and dry in contact with the glass upon which it has been developed; or it may be removed and dried between sheets of blotting-paper. You may also, as M. Warnerke has shown allow the film during development to remain upon the paper. To do this the edges of the paper are bent so as to form a tray, and the film is developed in the same manner as if it were upon glass. Before removal from the paper, the film must be perfectly dry, so that the needle may be pierced into it, and in this manner stripped from the paper.

Applied to the glass the varnishing is necessary, if the film has been much intensified. The varnish employed should be of that kind which dries up transparent without being warmed, and for this reason a benzole or chloroform varnish is to be preferred, as also a spirit varnish, which dries up with a smooth surface.

These paper emulsion negatives are scarcely to be distinguished, when finished, from collodion plates, and the copies furnished are vigorous and brilliant. Before printing, the film is made to adhere firmly to a glass plate by the aid of a little water and an india-rubber squeegee. That the films may be printed as well from one side as from another is simply a matter of course. This is a great advantage to the photographer, and one that is especially useful to him if he desires to produce carbon prints by single transfer, or to utilise the Lichtdruck process. Other advantages of the process are obviously the circumstances that, during the preparation and exposure of the film, no glass plates are necessary, while the films can be preserved afterwards with much greater facility. An artistic illustration prepared by the process will appear in the *Archiv* so soon as the weather will permit of its execution.

Instead of emulsion collodion, bromide of silver gelatine may be employed for coating paper. This gelatine has most extraordinary sensitiveness, equal to that of wet plates, and it may therefore be applicable to the taking of portraits in the studio. It is, however, very desirable that photographers should possess a more familiar acquaintance with alkaline development, for it can scarcely be said that the knowledge of its action and of its manipulations are as yet very wide-spread. In all dry processes, but particularly in the case of emulsion films, alkaline development is very valuable, as, by its means, a much shorter exposure may be given than is the case when an acid developer is employed.

A ST. LOUIS PHOTOGRAPHIC STUDIO.

[A CURIOUS element in American journalism, which is at times not a little surprising to the reticent Englishman, is the extent to which they deal with personal matters, in which our American cousins are manifestly deeply interested. Possibly a similar interest might prevail on this side of the water if it were considered decorous either to express it or gratify it. Here is a minute account of a studio in St. Louis under the management of a lady. Mr. J. H. Fitzgibbon, the editor of the recently-established excellent magazine, the *St. Louis Practical Photographer*, having surrendered his portrait practice, the duty is undertaken by his wife, and a St. Louis journal has the following account of a visit to the New Parlour Gallery of Mrs. J. H. Fitzgibbon.]

In all ages of the world the fine arts have been most highly appreciated and honoured among the most enlightened and intelligent nations. From this it is easy, and only just, to infer that wherever a love for the beautiful is found to exist among a people, there will be found education and refinement in a corresponding degree. Arts may be divided—first, into the useful and mechanical; second, into the polite, liberal, and fine. The branch of which we are now treating may be considered as a growth or offspring

belonging to painting, which is recognized as holding the next rank to music and poetry among the fine arts.

These reflections occurred to our mind while making a personal inspection of the various departments of the superb and most elegant New Parlour Photograph and Art Gallery of Mrs. Fitzgibbon. The premises occupied are most advantageously situated, being located at No. 415, Franklin Avenue, are amply large and spacious, no house of the kind, perhaps, in St. Louis possessing more favourable facilities for the conduct of a business of this character. The studio, or operating room, is well supplied with light from all sides, and has been recently fitted up in the latest and most approved plan. These facilities enable sittings to be made at any and all times, no matter what the state or condition of the weather may be. The picture and portrait gallery is fitted up with much taste and elegance, containing a large selection of pictures finished in water, oil, pastel, crayon, Indian ink, and other styles, among which may be found those of some of our most prominent citizens and also of our ladies, high in station and noted for their beauty and refinement. These fac-similes of nature are such truthful representations of their original counterparts that the observer is almost inclined to believe he is in the presence of their actual selves. In this art both Mr. and Mrs. Fitzgibbon have achieved a splendid reputation, and are noted for their faithful pictures. The especial characteristics of their style are, a marvellous freedom and boldness of touch, a wonderful freshness of colour, and a truth of character which bears the most striking individuality and fidelity to nature. Mrs. F. especially excels in the treatment of her visitors in securing an easy pose, in getting a natural expression, and in throwing just the right light, counteracted and set off by the proper amount of shade, upon this or that texture.

Mr. F. is one of the seven oldest photographers in the United States, having begun its practice two years after its discovery, in 1839, which gives him a practical experience of thirty-six years—thirty-one years of which time he has carried on the business in St. Louis. This long experience is known not only to the people of St. Louis, but all over the country, and to-day he is recognized throughout the United States as one of the fathers of photography. Mr. F. publishes a monthly magazine called the *Practical Photographer*, which is one of the only three journals of the kind published in the United States. This journal is very handsome, scientific, and illustrated, and almost indispensable to the progressive photographer. It is devoted to the elevation and improvement of the photographic art, and is kept fully up with, and often in advance of, the times, and is undoubtedly one of the best advertising mediums in the country.

Mr. Fitzgibbon is also permanent secretary of the National Photographic Association of the United States, which is no small testimony of the high regard in which he is held by his brotherhood.

Mr. Fitzgibbon, while he gives his general supervision to all the affairs connected with his elegant gallery, finds himself too much engaged on the *Practical Photographer* to personally attend to each of the many thousands who patronize the establishment, and has very judiciously turned over the management of the gallery to his most estimable lady, Mrs. Fitzgibbon, whose name is familiar to hundreds of our most fashionable and wealthy ladies.

We cannot close this sketch without advising our readers, when in want of an artistic painting or a life-like photograph, to call upon Mr. and Mrs. Fitzgibbon, at No. 415, Franklin Avenue, who are eminent in their profession and reliable in their work, and on all occasions study to please their patrons.

Personally, Mr. Fitzgibbon is an affable and courteous gentleman, while his excellent lady is ever agreeable, and uses every means in her power to make her visitors feel easy and at home.

ENAMEL OR CERAMIC PHOTOGRAPHS.

BY ALEXANDER L. HENDERSON.

[The following is the specification of an enamel process patented last year. We must leave to our readers to ascertain how far a practical process is described, or how far such principle as is apparent differs from that published many years ago by Temie de Motay.]

This invention has for its object the production of photographs in vitrifiable pigments, which may be burnt in upon enamel tablets, glass, porcelain, or metal, the colour of the surface being either white, black, or other colours.

In carrying my invention into effect, I produce first of all either a negative photograph or a transparency of the subject to be vitrified, according to whether the surface upon which the picture is to be placed, and which will hereinafter be termed the enamel, be light or dark in colour. If the enamel be white I treat the transparency with iodides, bromides, or fluorides, such as those of lead, platinum, iridium, manganese, cobalt, titanium, cadmium, mercury, antimony, copper, magnesium, iron, and silver, by floating or immersion. These iodides are combined with mordants, such as bichloride of tin, or chlorides of any kind, sulphantimoniate of sodium, and alkaline or other sulphates with mordants and silicates, which mordants are applied previously, simultaneously, or subsequently to the treatment of the transparency with iodides or bromides; should the intensity of the picture be too great it may be reduced by nitre or hydrochloric acid, or a mixture of both, or by any solvent of the iodides of the metal, or of the metal itself, of which the image is composed. The picture may now, if preferred, be submitted to the action of silicates, such as those of sodium or potassium, the effect of which is to produce the deposited metal as a silicate, which requires no fluxing at the subsequent stage, this being a flux in itself; after which it is transferred to the enamel, which is then fired so as to vitrify the silicate, although the conversion may be effected after its being transferred.

The picture need not necessarily be transferred from one material to another, but may be taken direct upon the enamel. It may then either be left as it is, or may be treated with fluoric acid, by which an intaglio is produced. This may be used as an engraved plate for printing, or may be filled up with enamel colour of any desired tint, and again fired.

If it be not desirable to convert the image into a silicate, or if by accident this conversion has been imperfect, the picture may be fluxed by any of the well-known methods of doing so. I prefer, however, the use of an emulsion, in which the solid matter is borate of lead formed by mixing together acetate of lead and bichloride of soda in their equivalent or combining proportions, the vehicle in which it is suspended being collodion, oil of spike, fat oil, or similar media. This is applied in the way well known to all enamellers.

If the enamel be black or dark, I employ a negative instead of a transparency; but in this case, as the resulting picture must be light in various grades of tone, it must be heated with the iodides or bromides of such metals as will produce a light image, such as those of tin, antimony, arsenic, or any metal that yields a light deposit. The picture thus formed is treated in the same manner as already described.

The proportions required connected with any of the operations depend upon the length of time the image is subjected to receive action, as well upon the tone or colour desired.

As an example of an average working I take of—

Bichloride of platinum, or its compounds	5 parts
Bichloride of tin, or its compounds	80 "
Iodine	to saturation
Acid, such as hydrochloric	900 "
Silicate of potash	30 "
Acetate of lead	40 "
Water	3,000 "

What I claim as novel in this invention is,—

First. The use of bromides and iodides separately or conjointly, used either with or without chlorides and mordants for the production of photographic enamels.

Secondly. The use of these bromides, iodides, and chlorides in conjunction with silicates, as described.

Thirdly. The dissolving away of the vitrified image by means of fluoric acid, and utilizing the intaglio thus obtained either for printing from, or for the production of another image composed of the same or a different material, as described.

as in this way one easily accustoms oneself to work with particular quantities.

The weak alkaline developer differs in some degree from that which we have just mentioned, and it should be used for treating the more sensitive films:—

A.—Carbonate of soda	...	10 grammes
Bromide of potassium	...	10 "
Water	...	200 "

Or, instead of the bromide of potassium, half as much bromide of ammonium may be employed.

P.—Pyrogalllic acid	...	10 grammes
Alcohol	...	80 "

In applying this developer, you add to twenty-four grammes of water one gramme of P, mix well together, and pour it over the film. The image then appears in all its details. Upon this, the liquid is poured back into the measure, a few drops of it are added, and the image therewith intensified. Or, if preferred, you may pour A over the film first of all, and then add a few drops of P, and, after a few minutes, one or two drops more, when the image increases in intensity.

The iron developer is managed by preparing, in the first place, two solutions; they are:—

A.—Boiled water	...	64 grammes
Citric acid	...	1 "
Nitrate of silver	...	2 "
Copper vitriol (sulphate of copper)	...	8 "

The copper salt is dissolved by itself, and then the silver and acid, having been likewise dissolved, are added. If prepared with boiled water, the developer will hold good a long time.

B.—Sulphate of iron	...	3 grammes
Glacial acetic acid	...	3 "
Water	...	100 "

Or

Sulphate of iron	...	5 grammes
Water	...	100 "
Methylated spirit	...	5 "

The film is first moistened with water, and then covered with A; this is then poured back into the developing glass, and then a few drops of B are added. The mixture is applied again and again, until all the details come out.

The acid, pyrogalllic, and silver developer is undertaken also with two solutions made up as follows:—

A.—Boiled water	...	64 grammes
Citric acid	...	1 gramme
Nitrate of silver	...	2 grammes
Copper vitriol	...	8 "

The copper salt in this case is also dissolved separately.

P.—Pyrogalllic acid	...	10 grammes
Alcohol	...	80 "

One gramme of P is put into the glass measure, and twelve grammes of water added to it, and the mixture is then applied to the film, until all the details of the image are developed. Then the solution is poured back into the glass, and a few drops of A are added. With this the negative may be properly intensified. You may proceed also in the reverse order by pouring some of A solution over the film first, and then adding some drops of P.

The fixing of the film is undertaken in the usual manner, either with a two per cent. solution of cyanide of potassium, or an eight per cent. solution of hyposulphite of soda. The process of intensifying may be resumed after fixing, if necessary, as in the case of ordinary wet collodion plates. The film may be intensified by means of Col. Stuart Wortley's process, the following three solutions being made use of:—

C.—Citric acid	...	1 gramme
Water	...	120 grammes
S.—Nitrate of silver	...	3 grammes
Nitric acid	...	1 gramme
Water	...	100 grammes
P.—Pyrogalllic acid	...	10 grammes
Alcohol	...	80 "

A sufficient quantity of C is poured several times over the well washed image, and then for every six parts of C there is added one part of S and P. This mixture will intensify with considerable rapidity, but it is necessary to wash well subsequently, to remove every trace of pyrogalllic acid. The film after development may be allowed to remain and dry in contact with the glass upon which it has been developed; or it may be removed and dried between sheets of blotting-paper. You may also, as M. Warnerke has shown allow the film during development to remain upon the paper. To do this the edges of the paper are bent so as to form a tray, and the film is developed in the same manner as if it were upon glass. Before removal from the paper, the film must be perfectly dry, so that the needle may be pierced into it, and in this manner stripped from the paper.

Applied to the glass the varnishing is necessary, if the film has been much intensified. The varnish employed should be of that kind which dries up transparent without being warmed, and for this reason a benzole or chloroform varnish is to be preferred, as also a spirit varnish, which dries up with a smooth surface.

These paper emulsion negatives are scarcely to be distinguished, when finished, from collodion plates, and the copies furnished are vigorous and brilliant. Before printing, the film is made to adhere firmly to a glass plate by the aid of a little water and an india-rubber squeegee. That the films may be printed as well from one side as from another is simply a matter of course. This is a great advantage to the photographer, and one that is especially useful to him if he desires to produce carbon prints by single transfer, or to utilise the Lichtdruck process. Other advantages of the process are obviously the circumstance that, during the preparation and exposure of the film, no glass plates are necessary, while the films can be preserved afterwards with much greater facility. An artistic illustration prepared by the process will appear in the *Archiv* so soon as the weather will permit of its execution.

Instead of emulsion collodion, bromide of silver gelatine may be employed for coating paper. This gelatine has most extraordinary sensitiveness, equal to that of wet plates, and it may therefore be applicable to the taking of portraits in the studio. It is, however, very desirable that photographers should possess a more familiar acquaintance with alkaline development, for it can scarcely be said that the knowledge of its action and of its manipulations are as yet very wide-spread. In all dry processes, but particularly in the case of emulsion films, alkaline development is very valuable, as, by its means, a much shorter exposure may be given than is the case when an acid developer is employed.

A ST. LOUIS PHOTOGRAPHIC STUDIO.

[A CURIOUS element in American journalism, which is at times not a little surprising to the reticent Englishman, is the extent to which they deal with personal matters, in which our American cousins are manifestly deeply interested. Possibly a similar interest might prevail on this side of the water if it were considered decorous either to express it or gratify it. Here is a minute account of a studio in St. Louis under the management of a lady. Mr. J. H. Fitzgibbon, the editor of the recently-established excellent magazine, the *St. Louis Practical Photographer*, having surrendered his portrait practice, the duty is undertaken by his wife, and a St. Louis journal has the following account of a visit to the New Parlour Gallery of Mrs. J. H. Fitzgibbon.]

In all ages of the world the fine arts have been most highly appreciated and honoured among the most enlightened and intelligent nations. From this it is easy, and only just, to infer that wherever a love for the beautiful is found to exist among a people, there will be found education and refinement in a corresponding degree. Arts may be divided—first, into the useful and mechanical; second, into the polite, liberal, and fine. The branch of which we are now treating may be considered as a growth or offspring

belonging to painting, which is recognized as holding the next rank to music and poetry among the fine arts.

These reflections occurred to our mind while making a personal inspection of the various departments of the superb and most elegant New Parlour Photograph and Art Gallery of Mrs. Fitzgibbon. The premises occupied are most advantageously situated, being located at No. 415, Franklin Avenue, are amply large and spacious, no house of the kind, perhaps, in St. Louis possessing more favourable facilities for the conduct of a business of this character. The studio, or operating room, is well supplied with light from all sides, and has been recently fitted up in the latest and most approved plan. These facilities enable sittings to be made at any and all times, no matter what the state or condition of the weather may be. The picture and portrait gallery is fitted up with much taste and elegance, containing a large selection of pictures finished in water, oil, pastel, crayon, Indian ink, and other styles, among which may be found those of some of our most prominent citizens, and also of our ladies, high in station and noted for their beauty and refinement. These fac-similes of nature are such truthful representations of their original counterparts that the observer is almost inclined to believe he is in the presence of their actual selves. In this art both Mr. and Mrs. Fitzgibbon have achieved a splendid reputation, and are noted for their faithful pictures. The especial characteristics of their style are, a marvellous freedom and boldness of touch, a wonderful freshness of colour, and a truth of character which bears the most striking individuality and fidelity to nature. Mrs. F. especially excels in the treatment of her visitors in securing an easy pose, in getting a natural expression, and in throwing just the right light, counteracted and set off by the proper amount of shade, upon this or that texture.

Mr. F. is one of the seven oldest photographers in the United States, having begun its practice two years after its discovery, in 1839, which gives him a practical experience of thirty-six years—thirty-one years of which time he has carried on the business in St. Louis. This long experience is known not only to the people of St. Louis, but all over the country, and to-day he is recognized throughout the United States as one of the fathers of photography. Mr. F. publishes a monthly magazine called the *Practical Photographer*, which is one of the only three journals of the kind published in the United States. This journal is very handsome, scientific, and illustrated, and almost indispensable to the progressive photographer. It is devoted to the elevation and improvement of the photographic art, and is kept fully up with, and often in advance of, the times, and is undoubtedly one of the best advertising mediums in the country.

Mr. Fitzgibbon is also permanent secretary of the National Photographic Association of the United States, which is no small testimony of the high regard in which he is held by his brotherhood.

Mr. Fitzgibbon, while he gives his general supervision to all the affairs connected with his elegant gallery, finds himself too much engaged on the *Practical Photographer* to personally attend to each of the many thousands who patronize the establishment, and has very judiciously turned over the management of the gallery to his most estimable lady, Mrs. Fitzgibbon, whose name is familiar to hundreds of our most fashionable and wealthy ladies.

We cannot close this sketch without advising our readers, when in want of an artistic painting or a life-like photograph, to call upon Mr. and Mrs. Fitzgibbon, at No. 415, Franklin Avenue, who are eminent in their profession and reliable in their work, and on all occasions study to please their patrons.

Personally, Mr. Fitzgibbon is an affable and courteous gentleman, while his excellent lady is ever agreeable, and uses every means in her power to make her visitors feel easy and at home.

ENAMEL OR CERAMIC PHOTOGRAPHS.

BY ALEXANDER L. HENDERSON.

[The following is the specification of an enamel process patented last year. We must leave to our readers to ascertain how far a practical process is described, or how far such principle as is apparent differs from that published many years ago by Temie du Motay.]

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SOLAR CAMERA ENLARGEMENTS IN CARBON.

THE use of the solar camera has been for some time past declining in the country: or, perhaps, we might more accurately remark, it has declined, and almost entirely ceased. There are many reasons which will account for this. Primarily, the rarity and uncertainty of direct sunlight, which is a condition of absolute necessity for the successful use of this mode of enlargement. Then, even when sunlight could be secured, the process of enlarging direct on sensitive albumenized paper was so tedious and slow that it almost rendered such a method prohibitory. Where development printing was considered good enough, the solar camera was useful; but, except as a basis for painting or for elaborate retouching, developed prints were rarely satisfactory, often poor in colour, and seriously lacking brilliancy. The very superior prints obtained by printing from an enlarged negative, and the improvements in producing such negatives, have brought this method of securing enlargements into general use, greatly to the advantage of that class of work generally.

We have recently seen, however, some direct prints produced in the solar camera which will go far, we think, to give that instrument a renewed tenure of favour. The prints in question are in carbon, produced direct on sensitized tissue by Dr. Van Monckhoven, and we were indebted for an opportunity of inspecting them to the courtesy of Mr. J. A. Spencer. Our readers know that Dr. Van Monckhoven is the inventor and patentee of an improved solar camera, with a reflector of great power, some of the finest solar camera prints ever seen in this country having been shown by Dr. Van Monckhoven when his new instrument was described. Using this instrument, and ordinary sensitive carbon tissue, he has found that the time required for printing is exceedingly short. The exposure of the specimens we examined had varied from four minutes to ten, and most of them were slightly over-exposed. About six or eight minutes appeared to be the best time. Carbon printers are familiar with the fact that sensitive tissue requires much less exposure than albumenized paper. In our experience we have often found one-third of the exposure sufficient; but judging from the time which would, in our estimate, have been required by albumenized paper, the exposure can scarcely have been more than one-tenth of the time required by silvered paper. If to this be added the possibility of reduction to be obtained by bringing in the aid of the continuing action which takes place in exposed carbon tissue, the exposure may be still more reduced, and possibly very considerably.

If the rapidity were obtained at the sacrifice of any good quality it would not be worthy of consideration; but the

prints in question were not only in every way excellent, but singularly fine; the modelling was unusually perfect, giving a rare softness and solidity to the images not often found in ordinary photographs. Of course much of this is due to the excellence of the original negatives, but it was clear that all the delicacy and detail in the negative had received full justice. When Dr. Van Monckhoven described his apparatus before the Parent Society, he exhibited clichés especially suited to the work, produced from the original negative by means of the collodio-chloride process, and some of the quality of the prints was doubtless due to the rare delicacy of the collodio-chloride image. But the negatives from which the enlarged prints to which we have referred were produced, appear to have been ordinary negatives, some varnished, and some unvarnished; some untouched, and some worked upon. We hope that in the forthcoming Exhibition all our readers may have an opportunity of inspecting similar specimens, as we have reason to hope that Dr. Van Monckhoven will contribute examples.

PRACTICAL EXPERIENCE IN CARBON PRINTING.

ON another page we publish a further very practical letter from Mr. C. Witcomb, of Salisbury. Our readers will remember that, some months ago, Mr. Witcomb, then little more than a tyro in carbon printing, gave a history of his experiences in carbon printing, adding some very valuable practical hints as to the mode in which he had overcome difficulties, and attained a high degree of success; that success. Since then Mr. Witcomb has gone on working the process, proving its capacities through the hottest and, therefore, most trying season of the year. The result is, that he is only still more in love with the process. He finds the method easy and the results exceedingly good. His customers like them, and are willing to pay extra for them. The commercial results are as satisfactory as the artistic. Mr. Witcomb's experience must be singularly interesting to professional portraitists. An example he forwarded to us is exceedingly fine. It is without the exceedingly glossy surface usually given to "chromotypes"; but has simply ivory textured surface given to the tissue by rolling or burnishing without the enamelling aid of plate glass.

Mr. Witcomb raises one or two points of considerable practical importance. The first will probably cause no controversy. It consists in a recommendation to allow the exposed print to remain a little longer soaking in cold water than is usual before commencing development with hot water. This commends itself at once to the judgment, and will probably be accepted without dispute. The second point relates to the strength of the bichromate bath for sensitizing the tissue. The bath recommended in the Autotype Company's Manual contains one ounce of the bichromate salt to thirty ounces of water. This Mr. Witcomb finds not sufficiently strong. The point is one for practical men, and can only be decided by careful observation during extensive experience. In Mr. Swan's early experience, and, we believe, his continued experience, he preferred a pretty strong bath, generally using one part of the bichromate salt in twelve parts by weight of water. A standard strength, which came generally into use when the process began to be practised by photographers, was one in twenty. In our own experiments we have generally used a solution containing one ounce of bichromate in a pint of water, and this we have found answer well. Mr. Witcomb speaks with much confidence of the value of a bath of similar strength, and his opinion is certainly worthy of attention. We strongly commend all our readers to read his letter with attention, and mark the enthusiastic confidence and trust which he has in carbon, as far surpassing silver in simplicity, certainty, and excellence, and also mark that it is the result of experience.

IRREGULAR PHOTOGRAPHIC EXPERIENCES.

MR. JOHN S. GIBON, in recording in our Philadelphia contemporary his labour in photographing in the late Centennial Exhibition, relates some interesting and curious experiences from which many hints may be derived. Here are some extracts:—

It was a matter of great wonderment with many, and experienced photographers were sometimes to be included with "the many," that we could succeed in producing such fine "interiors," irrespective of the masses of people constantly surging about. I am forcibly reminded of something that made a great impression on me at the time, and occurred whilst I was but an apprentice in photography. An old stager in the line of a "viewist" was showing me some gems, representing brooks and cascades, tripping and dashing through masses of well-defined foliage. In my innocence and ignorance I was quizzing him as to how he managed to make his pictures, some parts of which seemed to have had only instantaneous exposures, and others a very full time.

"Why, you young fool!" he replied, "do you not know that if you cannot get such a picture in half a second, the half of an hour will do as well?" So with us, the longer the exposure—with all due deference, of course, to the qualification of our plate—the better.

The columns, adornments, and masses of goods did not move; but the people, happily, passed along, and, but in exceptional instances, individual parties remained so short a time in any one place, that they made no apparent impression upon our plates.

The Centennial Photographic Company spared no expense in procuring the best materials, apparatus, lenses, and what they deemed the highest order of talent, to further their plans. Numbers of operators were congregated together, and I can bear testimony to the general disposition towards exchanging experiences, in preference to any reticence of opinion.

I must give Mr. Kilburn, of New Hampshire, the credit of having injected an idea into my head, that, without him, it would probably have been devoid of. We had been considerably troubled with streaks and curious markings in the "open skies" of some of our landscape negatives. After removing a plate from the silver bath, we had adopted the plan of well draining it, and then rubbing the back perfectly dry with "Jo" paper. Mr. Kilburn proposed to suspend the latter operation, and, simple as the expedient was, it seemed to remedy in a great measure the difficulty. It is astonishing how really valuable these little dodges become.

The Board of Finance had granted permission to a certain passenger railway company the privilege of running cars upon tracks planted most detestably near (photographically speaking) to the principal buildings. These cars—the rails upon which they were run, the sleepers that upheld the latter, and, in fact all the appurtenances to such a railway—gave us a heap of trouble.

As adjuncts to the making up of a foreground they were not a success, and it was difficult to secure the picture of a building when, *ad interim*, the scream of a locomotive's whistle would not be heard, or the clouds of steam escaping from it could not be seen.

I feel entirely confident in the assertion that railway accessories, consisting generally of lines or iron bars, of broken roads, ugly fences, dilapidated platforms, and hastily improvised ticket offices, are not, as a general thing, the happiest accompaniments to a picturesque composition. To get rid of these, then, the only resource was to remove to a long distance from your object, and force more attractive bits into your foregrounds by the use of even six or seven-inch lenses for stereoscopic purposes. My own preference finally induced me to adopt lenses of four-inch focal length as being the most generally serviceable.

In some cases, in order to supply the demand for pictures

of objects of extraordinary interest, we were ordered to make as many as one hundred stereo negatives without change of position. To facilitate this end, we had furnished to us boxes for stereoscopic purposes that carried four tubes upon their fronts. Using eight by ten plates, we could then obtain upon one glass two double negatives, each of them five by eight inches in size. Under such circumstances, however, we were sadly restricted as to much movement of the instrument. In the first place it was entirely necessary to have it scrupulously level. Then, obviously, you could neither swing the back, nor alter the upward or downward position of the lenses.

Again, all of the tubes had to be exactly matched, and I imagine that all will agree with me as to the difficulty in obtaining four objectives all equally perfect and persistently alike.

It will occur to many that we had a good many acres of ground to traverse over, and that some of the buildings represented large fractions of a mile in length. How did we manage the dark room operations will be the next query? In the photographic studio proper there was a good sized apartment, fitted with all the appurtenances of a "dark room." This was for general use, and intended as the centre of operations when our instruments were not removed too far from it. To provide for such emergencies, smaller, although convenient, dens were constructed in the most prominent buildings; and, again, every known moveable description of waggon, closet, or tent brought into use.

The most important of the latter contrivances was drawn around by a horse, and the appearance of the animal, with its burden, became sufficiently well known to claim for its historic pretensions. It was most certainly made the subject for a "poem," but that, like many another good thing, will have to be consigned to oblivion. Furthermore, we had two-wheeled arrangements that you could perambulate about in any direction. Sticking your body, from the waist upwards, in one of these, your nether extremities never failed of eliciting all sorts of remarks from the passers-by. One day, while seeking privacy in one of these travelling boxes, and being industriously engaged in the preparation of a plate, I was most unexpectedly treated to the capsizing of the whole concern. A sudden gust of wind, the precursor of a thunderstorm, swept over the affair and turned it upon me.

You can imagine the effect. The caboose was well supplied with chemicals, and carried a bath capable of coating eleven by fourteen plates. That drenched me from head to heels. The accompaniments of iron developers, pyrogallie intensifiers, and the hodge-podge of other little photographic niceties, all tended to my personal adornment. Half an hour afterwards the appearance of my face and body outrivalled the scars, streaks, or tattooing of any Fiji Indian, and I believe that if I had sought an engagement from Barnum as a specimen of ugliness I should have been at once offered a handsome livelihood.

The dragging around of these photographic vans was no great joke in the hot months, and although we condensed our outfit to useful and necessary things only, we still had a good deal of dead weight to tug after us.

For a day's work we had to be provided with at least three differently sized camera boxes and their appropriate lenses; tall and short tripods, with a step-ladder; baths, developers, collodions, and sometimes water; last, and heaviest of all, boxes of glass.

I have heard all sorts of assertions in regard to the capacities of an operator in the production of view negatives. Take them as they would run, assorted sizes, and with the aid of a competent assistant, I have felt completely tired out and overworked when I have brought in a return of fifty plates for a day's work.

I recall with the utmost reverence the stories that I used to listen to in the earlier days of photographic experiences, of how certain gentlemen, evidently magicians in

our art, were able to attend to the demands of hundreds of customers daily. With me, it has always taken time to make a negative—or, at least, a good one.

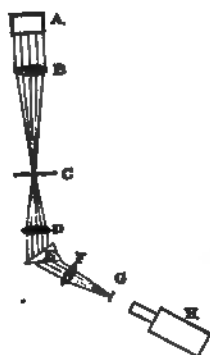
MONOCHROMATIC LIGHT IN PHOTO-MICROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.

WHEN using a microscope for photographic purposes, particularly when a high magnifying power is employed, the residual uncorrected achromatism is often very marked, and a photograph of any object is frequently ill-defined, particularly when the exposure requisite for one part is greatly different to that required for another part, since the exposure given to one may be sufficient to cause the lesser actinic rays to have an effect, whilst on the other only the more actinic rays are really utilized.

There is also always a difficulty in obtaining a true focus, many trial plates often being wasted in obtaining it actinic. When monochromatic light is used, however, this last difficulty vanishes, and, of necessity, there is no danger of want of definition from the inequality of exposure. I am not aware that the method now proposed has ever been adopted by photo-microscopists; at all events, I cannot find any published account of it. I therefore trust that, to the readers of the NEWS, it may be novel.

A is a heliostat throwing the sunlight on B, which is a condenser of four feet focus. D is a lens of about twelve inches focus, which takes the place of the collimating lens in any ordinary spectroscopic arrangement. The



Arrangement for Monochromatic Light with the Microscope.

rays of light, after passing through the condenser B, are focussed on the slit C. The lens D is so arranged that it throws the rays parallel on to the prism, E (which may be one formed with carbon disulphide). The rays of light, after being dispersed by the prism, are collected by the lens, F, which should be of varying focus according to the power of the microscopic objective. The spectrum so produced should be focussed on the slide G, containing the subject to be photographed, the camera, H, being in the position shown. Should it be feasible to hold the microscope in a horizontal position, there is no difficulty in this, but where the camera has to be in a vertical position, the mirror attached to the stand must be employed.

The higher the power the shorter should be the focal length of F. With a quarter-inch power, a focal length of 2½ inches will be sufficient. The reason of this varying focal length is that the whole of the subject embraced by the objective should be illuminated approximately by the same coloured light. For the same reason the slit should be rather widely opened—so wide, indeed, that its breadth should be at least equal to the breadth of subject in the field of the objective. This opening on the slit prevents the light from being absolutely pure, but it is sufficiently so to prevent any appreciable change of focus being required for the rays embraced in the small part of the spectrum employed.

A somewhat similar plan for obtaining monochromatic light may be substituted for the above. The sunlight may be thrown directly in the prism by the heliostat, and the rays brought to a focus on the slide by means of a lens. If this plan be adopted the impurity of the spectrum varies according to the focal length of the lens employed, since an image of the sun is formed by such monochromatic rays, and these overlap. Though more complicated, the first plan is considerably preferable where a high power has to be employed. In using this monochromatic light it is essential that the direction of the ray of light employed to illuminate the object should lie in the continuation of the axis of the objective; or, in other words, if the objective were removed it should strike the centre of the sensitive plate. Failures have occurred in my own practice through not taking this precaution.

With wet plates the best rays to employ are the blue immediately following the green in the spectrum; when the object is seen to be illuminated with the violet, the exposure will be found to be unnecessarily prolonged. With dry bromide plates a greenish blue may replace the blue rays. It may be noted that when working visually with the microscope the use of monochromatic light is a source of comfort, many details, which are only indistinctly seen, being rendered much more perfectly. By shifting the collimating lens in a plane at right angles to the general direction of the rays, a ray of any colour that may be required can be caused to illuminate the object; and, for visual observations, this is particularly useful, since some particular colour may be more suitable than another. When photographing opaque objects by the light they reflect, the difficulties increase; but when once they are illuminated by the proper light, cast at a proper angle with the axis of the objective, the employment of dry plates renders feasible what would otherwise be impossible when wet plates are used. The same may be said for the substitution of the lime light, or the electric light, for sunlight. With the two former it is possible to use wet plates when only moderate magnification is required, but when an amplification is required of five hundred diameters, dry plates or sunlight are essential.

A TOUR IN THURINGIA.

BY H. BADEN PRITCHARD.

THE Thüringer Wald, as a fir-clad district of hill and dale is called in Mid-Germany, has been a favourite playground of mine ever since I was a school boy at Martin Luther's "dear old Eisenach." I may not have all the affection for the quaint forest town that the great Reformer evidently felt, but of the charming woodland scenery around I have ever had pleasant reminiscences. There is a wildness and seclusion about Thuringia hardly to be found in other "beauty spots" so near great cities; and, although many travellers may actually come to Eisenach to visit the famous Wartburg, where Martin Luther was confined for some time, and where he translated a large portion of the Bible, these make but a flying visit of it, and are generally off again on their travels in twenty-four hours.

I have not moved out of my comfortable quarters at the "Rautenkranz Hotel," and shall be glad indeed if the rest of my holiday is spent so pleasantly. I do nothing all day but wander about the deep-shadowed pine forests, mounting a breezy peak to get some pleasant view, or looking up from below at some precipitous cliff, yellow and green with lichen and ferns. I have a small camera slung over one shoulder, and a Warnerke roller dark slide over the other, while my tripod constitutes a trusty staff. Inside this roller dark slide is a roll of sensitive tissue sufficient for thirty-five pictures; in my portmanteau at the hotel is another roll of equal dimensions. In my three weeks' holiday, therefore, I shall be able to take seventy pictures, and this, too, without the least trouble or bother. After making an exposure in the camera I have to turn a

roller with one hand, fix two buttons with the other, and behold! within the space of half a minute I am ready to take the next picture. I meet from time to time a sympathizing traveller.

"Ah! you work with dry plates, I see; very convenient, is it not?"

But when I show my light wooden box, and explain that I have sensitized material therein for nearly two score of pictures, the stranger is nonplussed, and would fain take the box in his hand and open it. But Mr. Warnerke has had the precaution to furnish it with lock and key, and, moreover, I will not let it out of my hands. But I show how it works—how the tissue is coiled from one roller to the other, as, bit by bit, it is exposed; and then our German cousin, who at once appreciates the wonders of the instrument, bursts out with such encomiums as, *wunderschön, prachtvoll, ausserordentlich, colossal, &c.*

But, after all, this forest scenery, these green hills and dales, mossy defiles, and grotto-like retreats, do not make very wonderful subjects for the camera, it may be said; or, at any rate, you could get camera-pictures of the same sort, and quite as pretty, nearer home. True; I admit it. But the district of Thuringia is something more than a holiday district. It is hallowed by history, and enhanced by romance. The Landgraves of Thuringia were the old feudal princes of Germany, as their strongholds, like those of the Picts, may be said to have never been invaded. Within a dozen miles of Eisenach you may probably count as many hill-tops that have once been surmounted by trusted burghs, of which many traces still exist; while for legend and fairy tale there is no more prolific district, the Harz mountains not excepted.

My first walk is on the road to Ruhla, a prosperous market town where the famous Ruhla meerschaum pipes are made, of which I am sure many of my readers have heard. At the old-fashioned village of Farnroda I step out of the main route for a moment to take a view of the Wittgenstein. This is a picturesque bit of grey rock, fringed with trees, and I manage to get some old farm-buildings as a foreground. There is a legend connected with this romantic spot which is worth telling. Once upon a time—I believe that is the proper way to begin—there was a castle on those heights, and in it dwelt a knight and his daughter. I need scarcely tell you that the daughter was very beautiful, for that is a matter of course; neither need I say that the knight, her father, was a "crusty old codger," for that, too, goes without saying. In time, a quarrel arose between them on the subject of a suitor, for when the father proposed a certain match, the daughter, it seems, had already set her heart upon a dashing young fellow who used to come to see her every night upon a coal-black charger. Upon this, the father, as was to be expected of him, stormed and fumed, and made use of bad language, of which I believe sounds and s' death formed prominent words, and at last sent out his vassals to waylay and murder the young man. The body of her lover was brought to the young lady, and she, as in duty bound, fainted away and expired on the spot. For a long time afterwards, however, the ghost of the slain rider came riding his coal-black steed to Wittgenstein, until at last, with the aid of the Evil One, the father was enabled to banish him to a mountain opposite. The spirit of the damsel still haunts the Wittgenstein to this very day, and it is not so long ago, we are told, some musicians returning home to Ruhla late one night, stopped opposite the place to give her a serenade. As they were packing up their instruments, a dwarf came upon them suddenly, and presented each with a twig of oak, which most of them, however, had pulled to pieces and thrown away by the time they reached home. One only stuck it in his cap, and he was surprised the next morning, when his wife asked him what that yellow thing was, to find a sprig of burnished gold, with oak leaves and acorns all of the shining metal, pinned to his wideawake.

That is why I stopped to take a picture of the Wittgenstein before going to Ruhla, where I take pictures of its narrow streets and its primitive kurbhaus; for Ruhla is a spa, as well as the seat of the pipe-making trade, although, seemingly, with few visitors. The little brook which runs down the middle of the place, and over which you may jump at a spring, serves to divide the duchies of Saxe-Weimar and Gotha. It does not matter much now, for it is all one "empire;" but time was, and that not ten years ago, when it was of some importance to an inhabitant of Ruhla whether he lived on one side of the stream or the other. Thus a man on the Gotha side could catch nightingales, and hang up their cage outside his door, while his neighbour over the way would be subjected to fine and imprisonment if he did such a thing.

On my way back to Eisenach I find plenty to do for my camera, the castle of Wartburg, upon its lofty pedestal, presenting now and then a magnificent object in the landscape. Then I come to the Princess rock, a steep, fantastic bit of cliff, and this, also, I must get a picture of for the sake of its legend. In this rock there is imprisoned a princess, who only appears in this world once every hundred years, and then, I believe, in the night. She has no end of money and treasure locked up with her, and any one who frees her from the charm or "spell" under which she suffers will secure princess and treasure for himself. This, however, can be done in one way only. When the princess appears she sneezes ten times, and if a man hearing her calls out *Gesundheit!* or "Your health!" after every sneeze, he secures the princess for a bride. The last time she appeared, it is said, that as soon as she began sneezing, a voice from the road once replied, *Gesundheit!* and did so, indeed, nine times running. But when the princess sneezed for a tenth time the voice grew angry, and was heard to say, impatiently, "Oh, go to the deuce with your sneezing!" Whereupon a loud burst of thunder came, and the princess was heard no more.

It is now growing dark, and, as I am a bit nervous, I shall go home.

THE TEXTURE OF NEGATIVES.

Mons. J. GILARD gives, in the *Moniteur de la Photographie*, some interesting details of a microscopic examination of the texture of negatives. He remarks, that a microscopic examination of the sensitive collodion film in its different stages, from the moment when it is plunged into the silver bath until the image is definitely fixed, presents numerous modifications in its molecular texture. These modifications take at first a basic character proper to each reaction, and then assume variations differing among themselves according to the elements placed in presence. They play an important part in photographic manipulations, for there are grounds for supposing that in determining, by means of the microscope, the effects produced in the impression of the sensitized coating, we can discover there the necessary elements for investigations in the case of failures.

The crystals of iodide of silver which are formed on the collodion during its sensitizing in a neutral silver bath vary according as the collodion is old or new. In the first case the surface presents a reticulated appearance, in which may be discovered irregularities or whites; in the second case it is covered with well characterized crystals, uniformly distributed; but in the places where the nitrate of silver has remained in excess, other radiating crystalline systems, like roses, show themselves in spots visible to the naked eye. If the plate has been washed on coming from the bath after sensitizing, no perceptible crystals will then exist. It is manifest, therefore, that different reactions show themselves in collodions more or less old placed in the same silver bath.

The reducing agent, either the sulphate of iron or the pyrogallie acid, causes the blacks and half tones to appear by forming a precipitate on the infinitely small crystals incorporated in the thickness of the sensitized coating. The

same reaction is also made on those which adhere to the surface, but without influencing the coating proper. This excess is kept there by capillary affinity, and constitutes the fog. It is certain that this multitude of crystals is superficial, since the fog may be removed with a wet cotton tuft, provided the coating offers sufficient resistance to bear its contact.

Examining any negative with a magnification of at least 800-1, we remark first in the clear portions, those that are the most diaphanous, crystalline molecules, no larger than the two-hundredth of a millimetre; it is these that form the fog. In the second case, in following gradually a tone of progressive intensity, we see in the thickness itself of the coating a number of small amorphous crystals, which are so much the more numerous in proportion to the darkness of the tone. They form by their agglomeration a felted concretion, impervious to light. Light decomposes the silver salts in a latent manner, the crystals of which dissolve themselves by the action of the reducer.

HELP ONE ANOTHER.

BY THOMAS L. PAVIOUR.

I AM sure it is with great pleasure that I congratulate Mr. Norman May on his subject entitled "Photography in America," which I read with much interest. I feel with him that there should not be such an indifference shown one towards another connected with the art of photography. Yet it is so. There are many who would clap their hands at the fall of a brother, and delight in seeing him come to the dogs. There is not a very great chance of English photographers catching up to the Americans when things go on in that way. If it is possible to help a brother, help him, and not run off to the Patent Office as soon as you have found out some little improvement. In short, if you cannot help him, do not hinder him. There are those retouchers and operators who prefer to hold secret some medium that they may have found out, and would not tell another on any account. But those who do their best, and try to be of some help to others, may receive the following, and give thanks by help in return:—

For Retouching.—To cause a tooth on varnished negatives, take a piece of india-rubber or ink erasure and rub lightly those parts to be retouched, taking care that all bright streaks disappear. There will be found tooth enough for a HH pencil, and may be worked over more than once or twice without destroying the tooth, which is a very great advantage sometimes.

For Enlarging.—Give your enlarged negative just half the exposure you give the transparency (silver), and you cannot fail. For portrait work in winter, a little acetate of morphia (say two grains to each negative) will be found a good thing, to help up the quality of the negative.

The cause of those streaks and flashes which are often seen in negatives, is to be found in the collodionized plate being put into the silver bath too quick. The plate, when ready, should be lowered to the top of the solution, and then firmly, but gently, moved towards the bottom of the bath.

For Working-up Autotypes and Touching Chromotypes.—Ivory-black and crimson lake I have found (only don't tell the Autotype Company) the best, as you can shade with the ivory-black to suit the tone of your picture. For autotype, use water; for chromotypes, use gelatine 1 ounce, water enough to allow it to swell for two or three hours, when it must be boiled until quite dissolved in four ounces of water, and not allowed to get quite cold while using.

Correspondence.

DESIGN IN PHOTOGRAPHY.

DEAR SIR,—It must be evident to all your readers that the beauties cannot be estimated nor the defects detected

in any thing of the formation of which the observer has not theoretical and practical knowledge. This is most especially the case with all works of art, without exception; therefore, it necessarily follows that without artistic education, the photographer is not able to judge of his own works: the gross blunders constantly to be seen, even in the most simple subjects, produced by ignorant operators, sufficiently confirms this.

With a mind so benighted as not to be able to discriminate between the grotesque attitudes of a dancing bear and dignity of a god, any attempt at grace either in attitude or expression must prove a failure. And what marks the difference? Simply the combination, proportion, and position of the lines forming the design. Allowing, then, the necessity of such knowledge, it seems somewhat curious that it is not more generally taught in schools as an essential part of youthful education, instead of being reckoned, as it now is, only an accomplishment, especially as it is as easily acquired as writing, and would materially aid the pupil in forming a good legible hand, instead of the horrible scrawls which are so frequently seen, bearing no traceable resemblance to the copies they have had placed before them. As many may have the will and the time to study, and yet may not be able to leave their place of business, or procure a master, I will point out a course, and make a few remarks by aid of which, with perseverance and well selected copies, any one of moderate capacity may become highly proficient in the art of design.

To begin with the beginning, a line is considered to be a continuous series of points; they may be termed straight, curved, or irregular; their position denominates them an upright or vertical, oblique, horizontal, angular, circular, oval, or spiral; the three latter may more properly be said to be geometrical forms. As a beginner must necessarily make many attempts before he can acquire sufficient facility of hand to produce any design worthy of being preserved, the materials with which he begins his studies should be of an inexpensive nature, as capable of being repeatedly used. The great artist, Giotto, when but a shepherd's boy, used to sketch portraits of his sheep upon the adjacent rocks. A board painted over with black flattening, and a piece of common chalk, or a sheet of glass ground on one side, using a blacklead pencil as a marker, are well fitted for this contrivance. Tracings can be easily made, and then reduced by the camera for magic lantern slides.

As drawing requires a greater freedom of the action of the wrist than writing, the back part of the fingers should be towards the paper or other materials on which the design is being executed; and it is best not to touch it with the fingers at all. A maul-stick is used by artists to support the weight of the arm; at the present stage it is not required, and better not used. Having an ensel, the pupil can either sit or stand while at work.

Fearing to take up too much of your space, I will with your leave continue this subject in my next paper.—I am, dear sir, yours truly,

JAMES MARTIN.

5, Clarence Place, Ilfracombe.

TOUGHENED GLASS.

DEAR SIR,—In your issue of the 24th I notice some remarks regarding the use of toughened glass for photographic purposes, and now have pleasure in handing you some particles which will no doubt prove of interest to your readers.

I may further add that toughened glass is decidedly much cheaper than ordinary glass if strength is anything to go by. As an example, supposing a party is in the habit of using 26-ounce sheet glass, which costs at the manufacturer's 4d. per foot; if he substitutes 15-ounce toughened sheet glass, which costs 2½d. per foot, he will save over 45 per cent., and still have the same or greater strength than he has in 26-ounce.

Our works are now in full work, and the glass is giving the greatest satisfaction, if we may judge from our influx of

orders. The thinnest toughened glass we manufacture is tested, before going out, with a leaden bullet, so that it would resist the greatest storm of hailstones that ever was.—
Yours obediently,
W. J. MASON, Managing Director.
79, Corporation Street, Manchester.

As the works of the company are situated in Stockport, no doubt a few further particulars will prove of interest to our readers. The character of toughened glass on its first introduction into the market was very much exaggerated. From the various erroneous accounts, most people are under the impression it is unbreakable. This is not the case; as its name implies, it is ordinary glass submitted to a process by which it is made tough, and becomes thereby some ten times stronger. For example, a weight of three ounces dropped from a foot high on to a piece of window glass of ordinary thickness will break it, whilst the same thickness of glass toughened will not break by dropping the same weight upon it from the height of twelve feet. We are told, and can readily believe it, that if toughened glass is taken the same care of as ordinary glass, breakage will be a very rare occurrence, and even in that case unusual violence will have to be brought to bear by throwing it about or striking it very heavily. From what we gather, the Toughened Glass Company, Limited, intend devoting their sole attention, at least for a time, to the production of window glass for Government and corporation buildings, railway and market roofs, mill, and other purposes of a similar nature. As toughened glass is not affected by any change of temperature, mill owners and others will find its use a great saving, for it is well known that the difference of temperature inside and outside of mills and works, more especially in winter time, causes ordinary glass to break and crack. Again, the sun's rays upon glass roofs often crack and break them, as one may see by examining any of the many railway roofs. Besides the purposes already named, toughened window glass will come largely into use for street lamps, sign writers, railway signal lamps, for photographers, and a variety of other purposes. Toughened glass cannot be cut with a diamond, but by machinery it can be both cut and polished, and we understand that toughened common window glass, cut and polished for such things as carriage lamps, looks quite as well as polished plate glass, and can be produced to sell under the price of the latter. Speaking of prices, toughened glass will naturally be dearer than common glass if used in the same thickness, but the Toughened Glass Company, Limited, intend applying their glass of a much less thickness to purposes where thick glass has been applied hitherto, and consequently it will be cheaper; for instance, a railway station roof, for which they employ at present rough plate half an inch thick; if toughened rough plate a quarter of an inch thick were used in its stead it would be some six or eight times stronger than the half inch, and the price would be considerably cheaper, as the cost of toughening would be much less than the difference in price between quarter and half-inch glass. Another great advantage to be gained by using toughened glass is, that architects will be enabled to erect much lighter structures to carry the glass. Such articles as dinner plates, dishes—in fact, all things which can be pressed or moulded—will be brought into the market so soon as the company have fully developed the window glass branch of their business. They are at present executing orders, at their works in Germany, for various descriptions of bottles, decanters, ale glasses, &c., and as this is a distinct branch of their trade, they do not intend transferring it to Stockport, as cheapness of materials, combined with cheap labour, more than compensates for the cost of carriage to this country. The bottles are of unusually great strength; indeed, those made of glass two millimetres thick (which is about the thickness of a wine bottle) will resist a pressure of 450 to 550 lbs. to the square inch, whilst those made four millimetres thick (say the thickness of a champagne bottle) will withstand a pressure of some 900 lbs. to the square inch. The works at Stockport, under the direction of Mr. John Jennison, assisted by a French engineer, are progressing very rapidly, and it is confidently anticipated that in the early part of July the company will be in a position to execute all orders entrusted to them.—*Cheshire County News.*

CHROMOTYPE CARBON PRINTING.

SIR,—Some months ago you favoured with a ready welcome two letters of mine despatched to your journal, and expressed the hope that any new experiences likely to be of value to the whole profession would be given freely to photographers in general, and not confined to the select circle of "Autotype Notes and Queries."

Well, I think I have got two points that are just worth noting, and one of them I consider of essential importance. Anyhow I shall throw them with a few remarks into general circulation, and as the matters are practical, any discussion that may follow will, I dare say, be of service.

First, let me say that my satisfaction with chromotype printing only increases. I positively find no difficulties,

and the favour of the public towards permanent prints augments every day. Not only in portraits, but in landscape work, chromotypes are demanded; and although Salisbury, having a whole rookery of photographers, has necessarily much competition, and prices miserably low, yet the public pay me, of their own choice, forty per cent. more for chromotypes than for silver prints, and do this not only because they are permanent, but also because they are more beautiful.

A little practice is necessary to estimate the printing quality of the negatives, and decide on the amount of exposure required, but this is soon obtained. We develop twelve cartes on a plate, and as our rule is never to under-print, but to reduce, if necessary, in development, with extra hot water, we come to the happy conclusion of not losing more than two or three per cent., and of having all the prints of such an equable depth of colour as cannot be managed with silver printing.

As to reticulation, I know nothing of it now-a-days. I perceive that the Autotype Company's tissue is tougher, less liable in hot weather to run in streaks when drying, and in several ways improved, and the present absence of reticulation may be due to this; but I have always differed with the Company's theory of the cause of reticulation, and feel sure that rapid drying has nothing whatever to do with it. Still, as reticulation is a fault that appears to belong only to the past, it is not worth further discussion.

For the summer weather, I find my suggestion of placing the bath solution in Winchester, wrapping a wet cloth round them, or allowing a stream of cold water to trickle over them for a couple of hours, reduces the bath to such a temperature as makes sensitizing quite safe. I hold also strongly to my expressed opinion to sensitize overnight, and only for the next day's consumption. I know thus exactly what I am about, and what to expect. If I chance to sensitize rather more tissue than wanted in the day, I simply throw it away. This I find to be the cheapest course.

Now, of the two items of information that I wish this letter to convey, the first point is very simple, and perhaps is more applicable to beginners. It is simply that when developing, and as soon as the paper has peeled off from the pigmented gelatine beneath, allow the plate to rest in the water for at least two minutes. The picture develops itself and gets intensity, and the danger of washing away some of the half-tone by the immediate lavement with hot water is wholly avoided. This is but a simple point; but I have known many beginners arrested at this stage by imperfect pictures, the cause of which I believe I have here stated.

My second point is, I consider, of great importance, and the statement of it will bring me a little in collision with the authorities at Ealing Dene. There was a time when I bowed humbly to the instructions of Mr. Foxlee, and have taken quietly several raps over the knuckles by Mr. Sawyer; but I am so satisfied with the results of my own observations, that I am not the least afraid to challenge an issue upon the point in question. This point is that the instruction in the "Autotype Manual" for preparing the sensitizing bath, by adding to one ounce of bichromate thirty ounces of water, is a mistake. This bath is too weak, and its use is the parent of a fruitful crop of difficulties. Of course I may be wrong, and I stand open to correction; but I never rush into print without carefully repeating my experiments over and over again, and this experience tells me that twenty ounces of water is the most that should be added to an ounce of bichromate. I consider this the *maximum*, and my practice varies from one in eighteen to one in twenty. I say that the feebleness of the image, the washing-up of high lights, and the loss of detail which bother photographers in carbon printing, are almost entirely due to the weakness of the bath. I am not chemist enough to say if the rule which gives a more vigorous silver print in a strong silver bath holds good in

the bichromate bath; but I am quite practical man enough to know that the bath to ensure good results, and to avoid a host of difficulties, is the strong bath, as indicated above. I have quite recently had a discussion with Mr. Foxlee on this point, and I have seen numbers of chromotype specimens done by the Autotype Company, and I say that from the same negatives in my strong bath I will get better results. I do not want to be one of the arguing sort, although I elect to stand up for my own opinions. The case is in a nut-shell; and I say to chromotype and carbon printers, try the strong bath instead of the weak one, and I think you will say that I have given a very useful and excellent piece of advice.

When I reflect, Mr. Editor, upon the absolute inexperience from which I started, I am surprised at my own success. Before I went to the Autotype Company's works, I had never touched carbon, and when I got there it was a day of terrific storm, and I felt half dazed with the novelty of the operations. However, I went home and tried, and tried, and tried. At the end of a month I said to myself,—"I am done. This chromotype will injure my health, spoil my temper, waste my money, and block up my business. I had better give it up." However—No. I thought I would have another trial, and in a fortnight after that, things began entirely to alter. My impression now, as a man of business, is, that the investment for a licence was the best photographic day's work I have ever done. It has increased my business, and added to my profits. It has led me to open a branch at Warwick, which at once succeeds by good permanent work; and I have farther, from my full persuasion in the matter, ventured on a considerable contract with the Autotype Company, and mean to push chromotype into fresh districts.

Hoping that my remarks may aid my brother photographers, and encourage the feeling that our work must be made permanent, I am yours, O. J. WILCOX.

Salisbury, Sept. 11th.

Talk in the Studio.

PERMANENT CARBON PHOTOGRAPHS.—It is only fit that the trade should impress upon the public the fact that these photographs are really as permanent as engravings. This once well known, the sale for such will be wonderfully increased. These prints in carbon will be perfectly distinct from prints in silver, and a print-seller may truthfully guarantee them being permanent as engravings. Therefore, to make such works popular, it is only necessary to put forward their cheapness and durability. Their effectiveness is apparent. Perhaps a little prejudice still exists against very large-sized photographs; but spacious rooms and halls require filling, and for such a purpose carbon photographs are well adapted.—*Stationer.*

ENGRAVED SURFACES ON METALS.—A pure silver surface is first taken, and after polishing, is exposed to the action of iodine, by which a film of iodide of silver is obtained. The plate thus prepared is then exposed to the action of the light under the photographic negative of the object to be reproduced until a faint image is obtained. The plate is then submitted to the action of an electrotyping bath, when a well-defined image of the subject will be obtained in copper—the latter depositing itself only on those portions of the plate that have been affected by the lights of the negative. The plate is next dried, and covered with an etching solution consisting of sulphuric acid and nitre (or their equivalents). This, it is affirmed at once attacks the shadows or exposed portions of the silver surface, while the electrotyped surfaces are not affected. After etching to the required depth, the copper deposit may be removed by *aqua regia*, bearing a finely etched image on the silver plate. To engrave on steel, copper, &c., it is first necessary to coat the surface with pure silver, after which the process is substantially the same as that above described, with such slight modifications in the etching solutions to be used as the nature of the metal employed would indicate.

CLEANING OF PLATES AND LENSES.—All persons who work in photography know, or should know, that to clean lenses, and to preserve the polish of their surfaces, they should not be wiped with a cloth, but after having removed the dust by means

of a brush, they should be covered with a thin coating of grease, then wiped with a piece of very soft chambray. An amateur asserts that for this purpose there is nothing better than chicken grease. Without contesting the merit of this fatty body, we simply use tallow, which we recommend not only for lenses, but also for plates which are to be collodionized. The dealers in glass plates for clichés coat them with grease, and simply wipe them before delivering them to photographers, and it is known that these plates generally give very pure clichés without any other cleaning. Many methods have been suggested for removing the varnish from old plates. A mixture of benzine and alcohol in equal parts, agitated and poured on the plates, generally acts very quickly and very well. The last traces of reduced silver which may yet adhere are then removed by iodized alcohol (alcohol 100, iodine 0.50). When the surface is properly cleaned it is rubbed over with the finger or a tuft of cotton lightly impregnated with tallow, and wiped dry. Plates thus prepared may be kept indefinitely, and are protected from dampness, the enemy which too often interposes itself between the collodion and its support. It is well to rub the plates, whatever may have been the previous mode of cleaning, with a little talc, which increases the adhesion of the sensitized coating, and does away with the gelatine or albumen, the use of which would otherwise be indispensable for the preparation of dry plates.—*Bulletin Belge.*

To Correspondents.

ONE WHO TRIES.—The silvery flakey scum which arises in developing is silver reduced to metallic form by some reducing agent present. It has been attributed to the use of impure acetic acid, containing some empyreumatic oil, which acts as a reducing agent, tending to fog. We have generally found it arise when using old and somewhat decomposed collodion. In this case the image is often thin and poor. 2. We have not met with the black streaks from the edges which you describe. They probably arise from the plate being dirty at the edges, or possibly from warm and perspiring fingers.

G. CLIFFARD.—The use of the hand-screen for controlling lighting cannot be verbally taught. It might be taught in practical lessons, or learnt by observation. As a rule, to use it efficiently requires experience, and this can only be obtained by trying. If a photographer have any idea of what effects of lighting he wishes to secure, he will soon be able to apply the hand-screen to the end required. 2. You speak of lighting *Rembrandts* as though some fixed rule existed as to their lighting. Sometimes they are chiefly lighted from the top, sometimes from a side-light in front, sometimes from a side-light behind. 3. It is wise, in replenishing a toning bath, to add all the same materials in the same proportions as at first, using, however, only one-third of the proportion of water.

B. L. F.—A very small proportion of chloride of silver distributed through a large quantity of water precipitates very slowly. Add a little nitric acid, shake, and then give it time. Do not add washing waters of prints which show little trace of silver, and generally avoid getting too much water with your chloride.

A. WILCOX.—Sprays and branches of trees may be kept in reasonably good condition by placing the stalks in water, changing the water every day, if the leaves require to be kept so long. The addition of a little ammonia to the water will revive the leaves when they show signs of falling.

H. B. F.—The paper you sent contains not a latent or undeveloped image, but the traces of an image which has faded out. At present there is no method known by which such an image may be brought back again. This is a subject well worthy of the attention of experimentalists. The material of the image is there, but it has lost its colour, and it is more than probable that under suitable treatment the dark colour might be restored. But little has been done in this direction, and at present no method of effectually restoring thoroughly faded photographs is known.

CRYSTAL.—The crystallized surface assumed by your tins on drying is due to excess of bichromate. You have either used the solution too strong, or allowed the tins to remain too long in contact with it.

A. KIMBLEY.—The glass house of which you send diagram will answer very well for amateur purposes. For busts, &c., it will be better than a larger studio. For full-length figures, groups, &c., you will need to take the camera outside, as you propose. Take care, in such case, to use a large hood to the lens, or some contrivance to shut off excess of light entering it. Always remember that the lens is a window admitting light into the camera, as well as an objective forming an image. We presume that the glass side of your studio will face the north. You need not then have any in the south side, but must use reflecting screens, which, skillfully used, will give good results.

Several Correspondents in our next.

The Photographic News, September 21, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. SPECIAL PHOTOGRAPHIC CORRESPONDENTS—PHOTOGRAPHIC LITERATURE—INTENSIFYING NEGATIVES.

Special Photographic Correspondents.—What are photographers doing at the theatre of war? Why have we no pictures from enterprising disciples of the camera? What would not some of us give to have a good photograph of the Sistova bridge, that narrow fragile span across the Danube which represents the weakest link in the Muscovite chain of occupation. It would be something to see a rapid photograph taken of this structure, of the artillery and train crossing, of reinforcements going to the front, of provisions and ammunition waggons threading their way across. Such a picture would give us here at home a better idea of the difficulties of war than columns of descriptive letterpress. People would then learn under what difficulties the Russian host is waging war, and realise how serious a thing it is to feed an army, and keep it going. Then, again, we want to see a camp, a real bivouac placed before our eyes. We want to see a group of Cossacks with their horses picketed in the background, or a pack of Bashi-Bazouks performing the duties of outposts. What sort of encampments do the soldiers construct in Bulgaria? Have they tents to sleep in, and what sort of tents? Do they entrench themselves, and place guns in position for protection? Have they field telegraph trains, pontoons for crossing rivers, and ambulance waggons? All these questions a series of photographs would answer in a moment, and how eagerly they would be scanned and paid for need scarcely be said. There is no need for the photographer to go to the front. Besides the risk of danger, there is the difficulty he would have in transporting his apparatus and paraphernalia. He would not need to go very far to seek food for the camera. Indeed, at the front we fear there would be few pictures to take. A stretch of gray, uninteresting country, with the enemy's lines barely visible a couple of miles or so in the distance, would make but a very poor picture in the camera, and would probably be of little value, either on the score of military or general interest. Camp scenes, such as any active man provided with passport and means could secure without difficulty, are what is wanted, and we are surprised, indeed, that no photographs of the kind are to be seen in our capital. The correspondents of illustrated papers need not be interfered with, for they do work which the photographer is incapable of performing, in the same way precisely as the camera can perform wonders which the pencil of the draughtsman fails altogether to depict. The field photographer could learn, however, something from the artist-correspondent. He would find that the latter does not care so much about depicting distant redoubts and long stretches of country, for when all is said and done, such pictures are of little interest; the representative of an illustrative paper seeks out a characteristic group, and from this he works up a telling scene. An ambulance waggon passing to the rear, a wounded man even, is frequently enough for the main feature of a picture, and minor details are soon filled in. If we have one incident truthfully set before us, we have but to multiply it in our mind in order to get a general idea. So it would be with the photographer if he went on the field. It would be little good, even if he were in a position to do so, to give us an instantaneous view of a fight some thousands of yards off. We might actually see a little fog representing smoke and dust afar off, but it would be the foreground that would constitute the picture. And if we did not see a disabled gun or a few marks of strife littering the ground, the view would fail to convey the slightest idea of a battle-field. The best war pictures we know of, photographs showing really that there has been a struggle, are some relating to the Chinese war of 1860; these represent the interior of the Taku forts, and bear a very truthfu

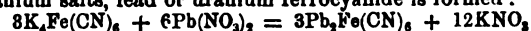
impress upon them, even if the score or so of Chinese dead were not there to tell you of the terrible fight that has just taken place. Another photograph, scarcely less vivid in demonstrating the fierceness of a war struggle, is shown in a photograph taken by Robertson, of the interior of the Redan after the terrible fighting, and its ultimate occupation by the British. Why cannot photographers do what they did fifteen and twenty years ago? We do not want battle-fields and scenes of horror, but we should like to see with our own eyes something of camp life, of an army on war footing; and this a field photographer could enable us to do. We should not then get our news at second hand, reading it in the newspapers, but could be in a position to view scene after scene as if we were in the field ourselves. Such photographs, too, would help us to comprehend far more readily the graphic letters that appear in our contemporaries, and to realise, as we have said before, the obstacles that have to be overcome and the hardships and privations to be undergone. It is said that, as special correspondents increase, wars will grow more rare, because the miseries and terrible realities of war are brought home more vividly to the people. If this is really so, would not photographers in the field work still more good by sending us the shadows actually of the scenes themselves?

Photographic Literature.—Another German photographic journal has come into being, called the *Deutsche Photographen Zeitung*, the editor of which is Herr K. Schwieler, of Weimar. It is to be a weekly paper from the first of January next, fortnightly till that time, and will constitute, therefore, the only weekly photographic journal in Germany unless the *Wochenblatt* is still in existence. Besides the *Zeitung* there are now five other German photographic journals published, namely: the *Correspondenz* and *Notizen*, of Vienna; the *Mittheilungen* and organ of the German Society for the Advancement of Photography; the *Archiv*, edited by Dr. Liesegang, at Elberfeld; and the *Anzeiger*, of Munich. The *Correspondenz* is the organ of the Vienna Society, and Dr. Hornig the editor thereof; while Dr. Vogel, the President of the Berlin Society, undertakes the editing of the *Mittheilungen*—these two, as our readers may know, being the principal journals printed in the German language. In France are to be found just now four journals, but only two of them, the *Moniteur* and the *Bulletin*, are of any particular value; Belgium has two journals, Holland, two, Italy one, and Denmark one. In America five journals appear, and in Great Britain three, two weekly and one monthly, during the session of the Photographic Society. As the English journals are more voluminous than most of the foreign photographic papers, and appear, too, weekly, more information is, without a doubt, published in this country than elsewhere.

Intensifying Negatives.—M. J. M. Eder's experiments in this direction may be summed up in a few words. In the method of intensifying negatives with potassium ferricyanide and a lead or uranium salt, nothing has hitherto been known of the reactions which take place. To investigate the reasons of the intensifying, the author acted on freshly precipitated silver with a solution of potassium ferricyanide, and found the following reaction to take place:—



When heat is applied, the mixture smells of hydrocyanic acid, and silver goes into solution. In presence of lead or uranium salts, lead or uranium ferrocyanide is formed:



Ferric salts cause a precipitate of Prussian blue, and with ferricyanide, of Turnbull's blue in the negative; this occurs either on silver or platinum negatives. As 2 equivalents of silver precipitate 6 of lead or uranium as ferrocyanide, while only 1 atom of platinum is precipitated by 4 of silver, 1 of gold by 3 of silver, and 1 of mercury by 2 of silver, it is evident that a greater intensification may be produced by means of lead or uranium, than with these metals.

PICTURE FRAMES AND THEIR MANUFACTURE.*

"Paste.—Mix one tablespoonful of wheat flour with half-a-pint of cold water, adding the latter gradually, and thoroughly stirring in each portion before pouring in more; place the vessel over the fire and stir the whole assiduously until it boils; great care should be taken to prevent caking or burning on the bottom. An addition of half-a-teaspoonful of powdered alum will strengthen the product. The addition of a few grains of corrosive sublimate, or a few drops of creosote, will prevent it from turning mouldy, and keep insects away. When too hard or dry it may be softened by beating up with a little hot water.

"Mitring Picture Frames.—In order to obtain instruction in the art of making picture frames, we will go into a shop where the frames are mitred together, fitted up, and turned out to be hung in the cottage or hall, and where all the frames from the gilder's shop adjoining come to be fitted up and completed. As we see two or three very busily engaged in various occupations, we will not interrupt them for the present, but take a critical survey of the shop. It is lighted by windows on two sides, and a stout wide bench runs under the windows round two sides of the room. At certain distances we see bench vices fastened, at some of which are men busily at work. Down the middle of the shop is another wide bench, and on it we see rolls of engravings, and some are fitted into frames. At the end of the room is a small circular saw driven by the foot, and on the opposite side of the shop a good stock of mouldings are arranged on bars let into the wall. We see four or five sizes and qualities of O.G. maple, a variety of patterns of inside slipping, beads, &c., in German mouldings, and a good stock of mouldings in the white ready to be joined before going in to the gilder; also gold mouldings packed in white paper.

"In a room adjoining this shop a man is seen busily employed packing a lot of pictures in cases ready to be sent out. The occupations of the men are various, and a division of labour seems to be the order of the day, as we see one actively employed in joining a large lot of maple frames with a large number down by his side; another is 'shooting' the moulding, while a third is cutting up mouldings. But we see a man in the centre of the shop looking over a book, and as he has a good-natured open countenance, we will draw near and see what he will say to us in answer to enquiries as to what his occupation generally is. He informs us that he is constantly employed in 'fitting up' all the best of the miscellaneous work, and that, in consequence of his work requiring great care, he does not get through so much. He fits up the gold frames finished in the gilder's shop with expensive chromes, proof engravings, oleographs, and oil paintings; he also fits up the best work in water-colour drawings, and is trusted with proofs and pictures to mount, some of which are worth as many guineas as there are days in a month.

"He informed us that he was called a 'fitter-up,' and that it was not his work to make frames, although he might be able to do so. As he had satisfied himself as to the work in hand, he was about to hand the book over to a man in another room who did 'mitring-up,' and he offered to show us the way.

"Our friend the 'fitter-up' was not aware we had been engaged for a number of years in gilding, and in a fine art repository, so treated us to a sight of some of the best chromes, little thinking they were old acquaintances, and that we had times before taken a pride in turning them out as he would do—first class.

"We were received by the man about to execute the orders in the book with civility, and he looked superior to the general class of men engaged in the trade. As we stayed with him some time we will describe the execution of the work required.

"As 'Frith's Derby Day' was wanted at once, he set to

work to cut out the mouldings, and mitre them up. It was to be framed in the best O.O.G. maple, with a broad gold flat and hollow inside, and the picture mounted on a stretcher. The sight edge of the inside gold, to allow of the requisite margin, must be 57½ by 29; and, unpaparing some broad gold, flat and hollow, he carefully cut out on the saw-block four pieces a little longer than the required length, to allow of 'shooting.' He next selected some of the best maple, O.O.G., and cut one end off on the saw-block to the required angle. He next took one of the pieces of gold flat and hollow, and placed it on the rabbet of the maple, and marked the length a little beyond the gold flat, and cut off the length. This he did with the three other sides. The 'shooting board' was next required, when he placed first the maple in position, and, with his plane, which had a good edge, took off enough to secure a good surface, and in the next place a clean top edge to the mouldings. The next piece selected for the same operation was the piece corresponding in length, and after planing to his satisfaction, he measured the two pieces by putting the two sight edges together and making them exactly of a length.

"Before shooting the gold flat (and hollow, he said he should put the maple together, so that they could more easily make the mitres in both to run straight.

"Taking the four pieces of moulding, he went to the bench vice, and fastened one of the long pieces therein with the rabbet outside, and the right hand end very near the jaws of the vice. He next took up one of the short lengths in the left hand, and placed the two ends together. The two pieces were not placed exactly together, but the piece in the left hand was brought back from the sight edge about one-twentieth of an inch. When he had satisfied himself as to the exact position, holding the two tightly together, he with a bradawl decisively made a hole long enough to go into the moulding in the vice. When this was done he enlarged the hole in the piece he held by a gimlet, so that the size cut brads would drive easily through it without much friction or danger of splitting the wood. A little thin glue was then applied, and the moulding placed together as before, holding it very tightly together, when a brad of the requisite length, about two and a-half inches long, was inserted and driven home. In driving home the brad the moulding held by the hand was found to have moved forward a very little by the force of the blows, and thus a capital mitre was made; a second brad was then driven home, and both punched below the surface. Had the brad been driven home with the mouldings exactly level this would not have been the case.

"The other two pieces were then joined in the same way.

"Two mitres having been made, two more remained to be put together. He then took one half of the frame and fastened it in the vice near one of the unmitred ends, and with the assistance of a lad on the other side of the bench he brought the two joined pieces together in their proper places, and with the bradawl and gimlet made the hole as above described; he then took the half out of the vice and put in the other half in the same way, and made the hole in the fourth mitre. He next glued the two ends of the piece out of the vice, and with the help of the lad brought the two halves together, and quickly and steadily drove home the brad. The frame was then taken out of the vice, and the other mitre attended to in the same way, and a second brad inserted, and the two punched below the surface. The frame was again put in the vice for the third mitre to have a second brad driven in, when both were punched below the surface, and the frame was found to be well and neatly put together. Rather thin glue was used, and he was careful not to put on too much, so that it would appear on the top of the mitres (see fig. 8.)

"Having so far completed the maple frame, he at once proceeded to mitre up the inside gold flat. Before taking it in hand he put on his left hand a glove made of chamotte

leather, explaining at the same time that in shooting and mitreing up gold mouldings, some of which were gilt down to the back edge, it was necessary to protect the gold from the heat of the hand, as inattention to this would be sure

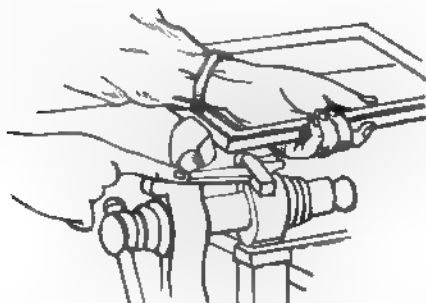


Fig. 3.

to damage a frame which was expected to be turned out in the best manner. He said also that a piece of soft cloth was glued down on the shooting board to prevent any scratches on the gold, and that he was particular to keep it free from shavings and grit.

"After seeing well to his plane-iron, the gold flat was soon ready for mitreing, and it was noticeable that he was very particular to get the length of the pieces, so that the frame would just take half of the rabbet, and the mitres by that means would range exactly. With his left hand still covered by a glove, he handled the moulding and mitred it up in the same way as before mentioned for the maple frame, and when completed the mitres looked like a hair across the corners.

"He next took the rabbet measure of the frame just mitred, and at once proceeded to cut out a stretcher from a large number of lengths of deal cut ready for the purpose.

"In marking out the stuff for the stretcher he explained that there was no waste, as in the ordinary moulding, as the length was cut from one side and the other, avoiding the cutting out of the triangular piece necessary to make the mitre. He also informed us that he knew it was the fashion in many country shops to make a stretcher by halving it together, but that a mitred stretcher was stronger, more expeditiously made, and was much neater than those made in such a way.

"He then 'shot' the lengths as usual, and soon put them together in the vice as before described, and fitted it into its place in the rabbet of the gold flat. The three frames placed one in the other were ready to go in to the fitter-up.

"Sometimes with O.G. maples the lengths are found to be warped, and when cut into the required lengths by the picture frame maker and made up, the frame is found to be twisted and the mitres bad. Mouldings should be kept flat before they are used.

"Where gold mouldings are gilded down the back edge, it will be necessary to lay in the vice some slips of wood covered with cloth, to prevent marking the moulding.

"There is a very good mitreing machine suitable for picture frame making in use in many shops, which does the work very well.

"We have described mitreing up a large frame, but smaller ones will not require the gimlet to be used before joining, as there is not the danger of the moulding splitting where small brads are used.

"Gilt slipping for the inside of maple, rosewood, oak, or other frames, requires care in mitreing up, owing to the thinness of the wood. Sometimes the wood will split, therefore the brads selected must not be too large, and the mitred pieces must be handled tenderly till the glue is dry. Where it is twisted or warped it is almost impossible to make a neat mitre, which is often the case with German mouldings.

"Oxford Frames.—These frames have become favourites within the last few years. They are made of oak with cross corners, and are got up in fancy patterns, some of which are finished with ultramarine on the bevels. They can be had of the wholesale houses of the following sizes:—

4½ inches by 3½ inches		16 inches by 14 inches	
7	" 5½	18	" 16
8	" 6	21	" 14½
10½	" 8	23	" 18½
12	" 10	29	" 21
14	" 12		

"They should be rubbed over with linseed oil, which will give the wood a richer appearance.

"Corners on German Frames.—On frames made from the best German mouldings, composite corners, gilded, look very well and will wear well. When the corners are ready it will be necessary to scrape the corners of the frame down to the whitening, or the ornaments, when glued on and backed up, will peel up. After backing up, gild in oil. We have seen brass corners on German frames, but they would look much better without any ornament than such unsightly things."

ON SOME PROPERTIES OF GLASS.

GLASS—whether in the form of the lens in the camera, or the support for the film in the negative, or, indeed, in any of the many shapes in which it is applied to photographic use—is looked upon as a substance of such complete permanency and unalterability that it is possible we may be thought guilty of exaggeration when we say that to find a glass which has a just claim to this popular opinion is very far from being an easy matter. That form in which the unblemished character of glass appeals most to the photographer is, naturally, the negative plate, of which some hundreds of thousands must be used annually; and so much does the common idea rule manipulative practice that it is scarcely too much to say that it is more than likely that the poor, much-abused bath is credited with many a vagary when it is perfectly innocent, and some chemical alteration of the glass is the source of the evil.

That glass is so liable to be altered a little reflection upon the difficulties found in plate-cleaning will show; for when a case arises where stains, &c., unmistakably point to the glass as the cause, it is evident its surface has not been mechanically abraded or scratched, and the change, whatever it is, must be of a chemical origin, though, possibly, mechanical in its immediate effect upon the deposition of the silver forming the image. We purpose to give some idea of the character of the metamorphosis is likely to be undergone by glass when exposed to the action of air or water. Forewarned is to be forearmed, and the deeper we are able to dip into the source of failures the more power do we obtain to prevent them.

Glass forms an interesting example of the fact that, whenever special excellence in a particular direction is to be attained, it must usually be at the expense of some quality or other. The various characteristics of glass—its hardness, lustre, permanency, insolubility, impressibility, &c.—prove this. It is in the main a silicate of soda or potash, or both, having combined with it other silicates, such as those of lime, alumina, baryta, &c. There is a glass made (silicate of soda) which is quite soluble in water—it has a beautiful sea-green hue as generally found in commerce—and between it and the most insoluble varieties, containing silica and aluminium in large proportion, there are all varieties of solubility to be found. Silicates of lime or potash separately are acted upon by water and acids, but, fused together, they are insoluble. The greater the proportion of silica and alumina glass contains the more insoluble it becomes, and it is the manufacturer's province so to proportion the ingredients of his glass as to

produce qualities most suitable for the object in view. In this country glass manufactured in Germany, France, and at home is to be purchased, and each has its peculiar characteristics. An extremely pale glass, almost colourless, was imported a number of years ago from Germany; but it gave way to the action of the atmosphere to a most remarkable extent, and we have for some years seen nothing of it.

It has frequently been stated that glass with an artificial surface—that is, one produced by polishing with abrasive powder—is less clean to work, and more liable to stain, than one with the natural surface first obtained after the sheet has cooled down. Though we believe it quite possible that more has been made of this difference of surface than the actual facts warrant, we can yet easily see why, apart from the supposed hardness of the hypothetical skin, artificially polished glass should be more readily acted upon by water or other chemicals. This surface being entirely given by a process of rubbing, or, as it were, minute scratching with a powder, it might be supposed that if it could be examined by a microscope it would be found rough, like "obscured" glass, and thus offer a greater amount of surface to be acted upon.

The action of water upon glass is to decompose it, the potash and soda and a little silica being dissolved; and the greater the amount of alkali present the quicker is the decomposition brought about. The action of the atmosphere is of a similar nature, the moisture always present to a greater or less degree being the real active agent; the common result is to separate the soda and potash, and to leave the silica upon the surface sometimes in a manner that is only perceptible upon heating, when excessively minute flakes separate and leave a dull surface. It has been stated that glass buried deep in the earth has been, when dug up, so soft as to be cut with a knife.

The use of soda for cleaning old glass plates is often recommended, and in its way, and with proper precautions, it is very useful; but it is to be remembered that it dissolves the silica of the glass, acting with greater or less effect according to its strength and temperature. If this be borne in mind many troubles will be avoided, numerous cases of ineradicable stains having been traced to overlong soaking in alkaline solutions. If proof were needed of the solvent and injurious powers to small quantities of water, if continued for a sufficient length of time, it will be only necessary to breathe upon one-half of a piece of patent plate glass, and, after immediately covering the film of condensed moisture by another plate to wrap up the two, place in a cold place for a twelvemonth, and then examine. The moistened part will be roughened to such an extent as almost to take the mark of a blacklead pencil. We have seen packets of several gross of plates entirely ruined from this cause; glass plates brought out of a cold store room into a damp atmosphere had condensed the moisture of the air upon their surfaces, and the packer had packed them without wiping them, as, indeed, it was scarcely likely he would think of doing. They remained immersed for a considerable time, and when opened were found to have the surface visibly eaten into, not a glass remaining that was fit for use; and there can be no doubt that there must be large quantities of glass similarly injured, though, unfortunately, not visibly so, the mischief only being observed after taking the negative.

Again; if further proof were required of the solubility of glass—that is, its decomposition, which must result in disintegration, and thus roughen the surface, if even microscopically, and render it liable to retain foreign matter—it would be found by boiling in a Bohemian glass vessel a weak alkaline solution in which litmus had been dissolved, and acid afterwards added to produce a faint reddening. The result would be that sufficient alkali would be dissolved out of the glass to restore the blue color to the litmus. This same experiment can be proved in a

homely way by adding a little red cabbage to distilled water, and boiling in such a vessel, when the distinct blue of alkali would be given to the water.

We think we have advanced sufficient facts to show that glass is by no means the unalterable substance commonly supposed. If it induce a little more care in the use of this necessary photographic adjunct our purpose will be served.—*Scientific American*.

AFTER-EXPOSURE WITH VIOLET LIGHT.

M. SCOTELLARI AMONG THE BERLIN PHOTOGRAPHERS.*

As may be inferred from our last number, M. Scotellari the proposer of violet-lighted studios, was in Berlin in the month of July. He desired to find purchasers for a new instantaneous process, and during his sojourn in the Prussian capital experimented repeatedly in the studios of Messrs. Loescher and Petsch, and of Messrs. Reinhardt and Lindner, in the presence of many photographers who were invited to witness the demonstrations; none of the latter were, however, attended with particular success. A part of his secret was, however, patent: to wit, a transparent cap for the lens, the top of this cap being merely covered with a thin sheet of violet tissue-paper. Such a tissue-paper may be easily prepared by any photographer if he dissolve aniline violet in alcohol, and having diluted some of the colouring matter with water, dip a sheet of tissue-paper into it. Through this thin sheet of violet paper, or diaphragm, an after-exposure of the plate takes place, such an after-exposure as has been frequently described in this journal before; so that this feature of the Scotellari method is certainly not new.

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* Photographische Mittheilungen.

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The wet bromide emulsion film repels any aqueous preservative very stubbornly, and a good deal of moving backwards and forwards of the plate in the preservative solution is necessary before the fatty streaks disappear from the surface of the plate. All the preservatives, too, which I tried and applied to the wet films had the effect of lessening the sensitiveness of the emulsion. Alcohol preservatives are more easily applied; but these diminish the sensitiveness of the plates still further, and render the negatives thinner. Quite different, however, is it when the preservatives are applied to a dry surface. In that case but very little decrease of sensitiveness is to be perceived, and this only in exceptional cases; while in some instances the sensitiveness is much increased by the application of a preservative to the dry film. Of a long series of such substances, of which I have made trial, the best results were furnished by white of egg, gelatine, and a mixture of tannin and gelatine. Many of the well-known preservatives, again, we found to work more favourably upon admixture with gelatine.

The undermentioned mixtures have afforded me the best results as preservatives:—

1. White of egg diluted with eight or ten times its volume of water, and treated with sufficient glacial acetic acid to give it an acid reaction. The mixture is shaken violently, and after standing ten to twelve hours, when the clear fluid has separated, it is filtered through paper.

2. Water 400 cubic cents.
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Gelatine 5 grammes.

The gelatine is swollen first of all with a little water, and then dissolved at a warm temperature, when the acid is added.

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This solution is mixed with an equal volume of No. 2; the mixture is turbid, and, after eight to ten days' standing, a brown precipitate is formed. The solution is then filtered, and retains an odour of tannin.

By employing preservatives of the last kind (No. 4), very vigorous and intense negatives are obtained. Preservatives Nos. 1, 2, and 3 give softer negatives. When the preservative is washed, after application to the plate, the negative is always softer than when the former is not washed.

The treatment of the plates with the preservative is an easy matter, and soon done. The dry film may be moistened by pouring over it a mixture of thirty cubic centimetres of water and ninety of alcohol, which is afterwards washed off until the fatty streaks disappear, when the preservative is applied, being poured over two or three times successively. I prefer afterwards to wash my plates with a little spring water, so that on drying the plate has a matt appearance.

No one who has but a brief experience of emulsion bromide of silver plates can fail to value them very highly.

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Only a well-marked photograph with bold lines, and in which minor details are of no account, is suitable, and the negative is in the first place put into a camera or other apparatus, to furnish an enlarged positive. Upon this enlarged positive are traced, in Indian ink, the bolder lines which it is desired to retain, a pen or brush being employed for the purpose, according to the nature of the work or the desire of the draughtsman. After all details have been in this way traced with thoroughly black pigment, the lines of a thickness corresponding to the original object, and of such a nature as to be readily reproduced by photography, the print is treated with chloride of lime or other bleaching agent, and in this way was the whole of the image obliterated with the exception of the block lines made by the draughtsman.

The picture is now photographed, and in this way a small negative secured, or one, at any rate, of the dimensions of which the printing block is to be. In this case the negative will be perfectly opaque in the lights and transparent in the shadows, and from it may be easily produced, by any of the etching processes, an engraving upon zinc capable of being used in the printing-press with type.

Chloride of lime is specially mentioned as the bleaching agent wherewith to render invisible the details of the silver image after the draughtsman has done his work. We should think that a solution of bichloride of mercury would be much more effectual in making the original photographic image disappear.

A NEW GOLD SALT FOR TONING.

BY DR. J. ROHNSDORF.

UNTIL now there have been used only the single and double chloric salts of gold for toning. During the past winter Mr. Neumayer, student of chemistry from Munich, visited my establishment, and undertook under my directions the preparation of a gold bromide and a gold bromide of calcium, for the purposes of experimenting with these salts and their uses in photography.

Thin leaves of gold are readily dissolved in bromine water and in bromine gas. But a more rational and less disagreeable mode of preparation is by the action of hydrobromic acid, nitric acid, and aqua-regia.

During the evaporation of the gold bromide, which has a dark appearance and smells strongly of bromine, great care is necessary, owing to the fact that the gold bromide vaporizes more easily than the chloride. Bromide of gold is difficult to crystallize. By the addition of an exact equivalent of bromide of calcium dissolved in water, and evaporated, small granite-red crystals of double salts are obtained. $KBr + AuBr_3 + 5H_2O$ can be with difficulty dissolved in water; but a thin solution is of a deep red colour, and effloresces in dry air.

I have tried these double salts, also the gold bromide, with several additions, as a toning bath. In its general effect on silver copies it is analogous to gold chloride combinations, except that in the same proportions it acts more energetically.

The addition of soda bicarbonate gives a blue-black tone, melted acetate of sodium a purple coloured tone.

For a lasting gold bath, in form of a sol encaustic, these salts are recommended.—*Archiv.*

produce qualities most suitable for the object in view. In this country glass manufactured in Germany, France, and at home is to be purchased, and each has its peculiar characteristics. An extremely pale glass, almost colourless, was imported a number of years ago from Germany; but it gave way to the action of the atmosphere to a most remarkable extent, and we have for some years seen nothing of it.

It has frequently been stated that glass with an artificial surface—that is, one produced by polishing with abrasive powder—is less clean to work, and more liable to stain, than one with the natural surface first obtained after the sheet has cooled down. Though we believe it quite possible that more has been made of this difference of surface than the actual facts warrant, we can yet easily see why, apart from the supposed hardness of the hypothetical skin, artificially polished glass should be more readily acted upon by water or other chemicals. This surface being entirely given by a process of rubbing, or, as it were, minute scratching with a powder, it might be supposed that if it could be examined by a microscope it would be found rough, like "obscured" glass, and thus offer a greater amount of surface to be acted upon.

The action of water upon glass is to decompose it, the potash and soda and a little silica being dissolved; and the greater the amount of alkali present the quicker is the decomposition brought about. The action of the atmosphere is of a similar nature, the moisture always present to a greater or less degree being the real active agent; the common result is to separate the soda and potash, and to leave the silica upon the surface sometimes in a manner that is only perceptible upon heating, when excessively minute flakes separate and leave a dull surface. It has been stated that glass buried deep in the earth has been, when dug up, so soft as to be cut with a knife.

The use of soda for cleaning old glass plates is often recommended, and in its way, and with proper precautions, it is very useful; but it is to be remembered that it dissolves the silica of the glass, acting with greater or less effect according to its strength and temperature. If this be borne in mind many troubles will be avoided, numerous cases of ineradicable stains having been traced to overlong soaking in alkaline solutions. If proof were needed of the solvent and injurious powers to small quantities of water, if continued for a sufficient length of time, it will be only necessary to breathe upon one-half of a piece of patent plate glass, and, after immediately covering the film of condensed moisture by another plate to wrap up the two, place in a cold place for a twelvemonth, and then examine. The moistened part will be roughened to such an extent as almost to take the mark of a blacklead pencil. We have seen packets of several gross of plates entirely ruined from this cause; glass plates brought out of a cold store room into a damp atmosphere had condensed the moisture of the air upon their surfaces, and the packer had packed them without wiping them, as, indeed, it was scarcely likely he would think of doing. They remained immersed for a considerable time, and when opened were found to have the surface visibly eaten into, not a glass remaining that was fit for use; and there can be no doubt that there must be large quantities of glass similarly injured, though, unfortunately, not visibly so, the mischief only being observed after taking the negative.

Again; if further proof were required of the solubility of glass—that is, its decomposition, which must result in disintegration, and thus roughen the surface, if even microscopically, and render it liable to retain foreign matter—it would be found by boiling in a Bohemian glass vessel a weak alkaline solution in which litmus had been dissolved, and acid afterwards added to produce a faint reddening. The result would be that sufficient alkali would be dissolved out of the glass to restore the blue order to the litmus. This same experiment can be proved in a

homely way by adding a little red cabbage to distilled water, and boiling in such a vessel, when the distinct blue of alkali would be given to the water.

We think we have advanced sufficient facts to show that glass is by no means the unalterable substance so commonly supposed. If it induce a little more care in the use of this necessary photographic adjunct our purposes will be served.—*Scientific American*.

AFTER-EXPOSURE WITH VIOLET LIGHT.

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The Photographic News.

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THE PRINTS WHICH HAVE FADED.

A WELL-KNOWN chemist and metallurgist, who took an active interest in the progress of photography in its early days, recently remarking upon the energy devoted to the perfection of carbon printing, observed that whilst that was a good work, a still more important field, in his opinion, remained altogether uncultivated. One of the highest prizes, both in praise and profit, remained open, he thought, to the man who should discover a certain and efficient method of restoring faded prints. This, he added, he had no doubt was quite possible, as the image still undoubtedly remained; it had changed, but nothing was lost. The silver and gold of which the picture consisted in its pristine beauty were there in the image still, but their condition was changed, and with change of condition had come change of colour. Any agent which would restore the former condition would restore the colour, and the picture would again be resplendent with the bloom of its young beauty.

It is indeed marvellous how little has been done in this direction, when it is remembered how valuable such a method would be; and that wealth would probably await the discoverer should he be fortunate enough to defend his discovery from the nibblings of those who knew all about it before, and stigmatized it as neither new, nor true, nor useful! It is probable that a considerable amount of intelligent experiment would be necessary. The path is not quite plain theoretically, inasmuch as the precise nature of the change undergone by a print in the process of fading is not well ascertained. But there are two methods which have been tried with some degree of success for restoration of faded prints, which are worth further attention, especially as it is probable that many of the young and enthusiastic photographers of the present day may not be familiar with methods to which but little attention has been given.

The methods which have been tried have, curiously enough, never come into general practice, probably because whilst considerable improvement is effected upon the faded print, it is not absolutely restored to its original condition. The first method consists in treating the print with bichloride of mercury. The faded print is immersed in a weak solution of bichloride of mercury (one grain of the bichloride to an ounce of water will serve). Or another mode of applying the mercury salt may be adopted. Pieces of blotting-paper are damped with a stronger solution, and the print placed between the moistened sheets. This effects the same purpose, and renders the subsequent washing of the print less troublesome. The change which is seen to take place consists in a removal of the yellow tint generally seen in the whites of a faded print, and in

changing the blacks, which have generally lost warmth richness, and assumed a grey tint, to a much redder. This redness is sometimes carried so far as to seriously impair the beauty of the print, and this is one of the objections, we apprehend, to the process, which has stood in way of its adoption. This defect may, however, be rid of by a method we shall indicate presently. When solution of bichloride has done its office, the print should be thoroughly washed, and as the mercury salt is one readily soluble, considerable washing is necessary to effect its entire removal.

The other method of restoration consists in immersing the faded print in a neutral solution of chloride of gold, or, better still, of the chloride of gold and potassium chloride of gold and sodium. If the weather be cold solution may be very slightly warmed. The strength of the solution is not important, but if it be weak, the operation is slow. We have used a one-grain solution with advantage. The operation should be conducted in a light, and the print carefully watched. The yellow tint removed, and the whites and more delicate half-tones little bleached. If an ordinary commercial sample chloride of gold be used, without neutralizing, contain as it does, some traces of hydrochloric acid, considerable bleaching will take place, so seriously reducing the vigour of the print that the restoration of colour scarcely compensates for the loss of force.

Some attempts have been made to restore the faded image, when it has nearly disappeared, by development with gallic acid, but without success, some restoration of the image being more than compensated by the staining which generally results from the process. We recently received from a correspondent a request that we would "develop the latent image" on a piece of paper enclosed. On examination we found the supposed latent image to be an image faded, leaving only some faint yellow stains on a piece of albumenized paper. Our correspondent evidently thought—and, probably, not unnaturally—that the picture which the paper had once held was there still, only that it had become latent. The silver and gold of which the image had been formed were doubtless there, but by chemical change, assumed the form of colour salts. As we have said, one of the great wants in connection with the art is a method of restoring the image blackening again the metallic salts of which it consists. The search for a method is one well worthy of the efforts of the experimentalist, and will no doubt well repay the ceaseless discoverer of an efficient method.

ADIACTINIC GLASS FOR DARK ROOMS.

One of the difficulties experienced by the experimenter when working with extremely sensitive preparations arises from the sensitiveness of such preparations to traces of light in the dark room which had been found quite harmless when working the usual processes. This has been found especially the case in working with some of the more sensitive emulsions, which for with the usual yellow light employed in working wet plates. Two thicknesses of silver flashed orange glass will generally serve to protect the most sensitive plates; but where this fails a preparation supplied by Mr. Baily, which we noticed some time ago, may be tried. Mr. Baily has found a salt of chrysoidine, one of the aniline dyes, answer. He says:

"During the last two days in my studio, employing silver bromide for dry plate work, I have made use of white glass coloured by a preparation of aniline to light up my dark room. Among the numerous substances which I tried, one above all has in a high degree the property to arrest the active rays of light. This substance is named 'chrysoidine.' Chrysoidine is a crystalline substance, excessively rich in colouring matter, of a reddish yellowish appearance, soluble in water and alcohol, which facilitates its employment as a varnish to cover a pane

glass, or intermixed with gelatine in order to make a pliable film, or a stain or a dye in order to colour paper. To make a varnish it suffices to dissolve the powder in a varnish made with alcohol, leave it to cool, and then to filter it; it can then be employed as the ordinary varnish. Collodion with chrysoidine is prepared by replacing the alcohol by an alcoholic solution saturated with chrysoidine. The ether will precipitate a part of the product; it is, therefore, necessary to leave it a certain time to itself, and then to decant it with care. This preparation, poured upon a sheet of glass as collodion, gives a very intense colour, and replaces very advantageously yellow glass as employed at the present day. In some cases it is preferable to cover both sides of the glass with the varnish. One of the best means to utilise this product is to make pellicles of gelatine:—

White gelatine	300 grains
Water	1,900 "
Chrysoidine	40 "
Glycerine	46 "
Water containing 2 per cent. of alum	616 "

Begin by dissolving the chrysoidine in the 1,900 grains of hot water; filter, and allow it to cool. Proceed in the same manner as if you desired to make pellicular negatives by the method of M. Jeanseaud. It is necessary to have a pellicle as thick as possible, to obtain which, after having covered with talc and collodionized the glass, put a rim round it composed of soft wax. A kind of tray is thus obtained, into which the solution of gelatine is poured. The glass is now levelled, and the gelatine left to dry. When dry it is coated with a collodion containing castor oil. If the formula has been carefully followed a pellicle will be obtained of a ruby-red colour, which will arrest nearly the whole of the actinic rays of the spectrum.

"An excellent anti-photogenic paper can be made by impregnating a thickish white paper with a solution of—

Water	100 grains
Alcohol	2,300 "
Chrysoidine	47 "

The paper dyed in this solution can be employed to intercept the actinic rays from entering the dark room, for packing all substances liable to be spoiled by white light, such as dry plates, wet and dry emulsions, &c.

"A magnificent red dye named 'eosine' is equally soluble in water and alcohol, and can be employed in the same manner as chrysoidine; but as its power of colouring is inferior to the last-named substance, double the quantity must be employed."

A TOUR IN THURINGIA.

BY H. BADEN PRITCHARD.*

I FIND, as I proceed with my photographic work, that lookers-on are all impressed with one idea, that my apparatus is a plaything and nothing more. If I did not hold fast to camera and lens, and had not a companion to help me take care of the apparatus when I pull it out or put it away, bystanders would not have the least hesitation in good-humouredly overhauling it, so delighted are they, evidently, with the compactness and practicability of the whole affair.

A picture of the market-place at Eisenach, which I secure, with the old town hall at one corner and the grand ducal palace at the other, serves to gather round me half the inhabitants, whose only failing is that they are so overbearingly good-natured. Everything they do is done in a spirit of fun and good-will, and perhaps that is why I feel so annoyed with them at crowding round me. But I must say they are very good when the exposure begins, and, to show they know all about it, keep still as statues. Even the wooden-looking little soldier, with his

square-cut coat and spiky helmet, on guard before the palace, comes to a sudden standstill, and remains the while so stationary that he might have been made of lead.

But the good people want a reward for remaining quiet. "Now, I do pray you, tell me where I can get a copy of the photograph. I was standing right in the middle of the square, and kept perfectly still on purpose."

Even the item of the German army would come over and join his prayers to the others, only he dare not leave his post for fear the Grand Duke may be looking out of the window.

The old drawbridge and heavily-ironed gate of the Wartburg Castle make another good photograph, as also does the *Ritterhaus* to your right on entering, which remains exactly as it was when worthy Martin Luther found an asylum within its walls. The Luther rooms are intact and are shown to visitors—his bedstead, his arm-chair, his goodly flagon. On the walls are antique pictures of his parents and of the worthy doctor himself, but at one spot the plaster has been picked away, and the rough mortar is seen underneath. In this room it was that, when Luther was engaged in translating the Bible, the Evil One appeared to him as a tempter, and the reformer became so angry at the interruption that without more ado he threw the inkstand, ink and all, at the devil's head. The black stain upon the wall remained, we are told, for years, but now it has been removed bit by bit by relic-hunters, who have left the wall in the dilapidated state I have mentioned.

Martin Luther must have been a cheery, light-hearted, genial soul, one who took anything but a black view of the world.

"Who loves not woman, wine, and song,
Is but a fool his whole life long,"

was the substance of one little motto he wrote on the walls of his chamber; and his poems and hymns seem to tell far more of smiling nature, its warm sunshine, its bright green woods and chattering songsters, than of vaulted cell and cold penitentiary observances. For many months he was sheltered from harm by the grey old walls of the Wartburg, whose towers were simply impregnable in those days. No doubt whatever he had the Wartburg in his mind when he wrote the well-known hymn:

"Ein feste Burg ist unser Gott."

But it is not Luther alone who has made the Wartburg famous. It was here, exactly five hundred and seventy years ago, that the German bards or Minnesingers held a famous tournament, when the passion of the competitors waxed so high that it was decided the least successful should suffer death, a sentence which was not, however, carried out, on the intercession of the duchess.

The Wartburg, too, appears as one of the scenes in Wagner's opera of "Tannhauser," for the legend makes mention of the old burg; and the story of the Holy Elizabeth, who was once mistress of the castle, is yet better known. Elizabeth was the wife of the Landgrave of Thuringia, and her good deeds had made her beloved throughout the country. Her husband, however, looked coldly upon the merciful missions of his wife, and one day, returning from Eisenach, he met the Holy Elizabeth near a well at the foot of the burg, attended by her ladies, and carrying food and provisions in baskets to take down to the poor in the valley. Elizabeth, fearing the anger of her lord, at once covered her basket with a cloak. But he was not to be deceived.

"What have you there?" he cried passionately, tearing back her garment.

The basket stood revealed before him, but it was full, not of food, but of white roses.

The Elizabeth well is hidden away in the trees, and I have to search well before I find it. A roughly-wrought semi-circle in the rock, all moss-grown and worn by time, now marks the spot of the miracle, and at the foot of the

* Continued from page 440.

fountain are stone benches and a curiously carved font. No ray of sunlight penetrates through the dense beech boughs overhead, and, although I give an exposure of fully ten minutes, I hardly fear that I have secured a picture of the interesting retreat.

Behind the Wartburg is one dense mass of forest—a surging sea of leaves—and I descend into the valley once more to take views of a fairy dell I wot of. It is a narrow path in the wood between two precipitous rocky walls, so close at times that two people cannot well pass one another. It is the Annathal, and, where the path is so narrow, it is called the Dragon's Defile. Sometimes one can hardly see the narrow strip of blue sky overhead, so overgrown are the mossy rocks with clematis and greenery. Supreme quiet reigns in this cool, grotto-like retreat, whose walls sparkle with glistening drops of moisture, while here and there a recess full of moss and delicate ferns add their charms to the fairy abode. As you emerge into the beech-wood again, the air feels quite warm against your cheeks, and sweet forest odours come floating towards you.

You might pass day after day here gathering pretty pictures, for there is not a breath to quiver the delicate undergrowth, or bend the crimson fox-gloves, which are still blooming. A transparent green light, as the sun sheds its rays above, falls upon the scene, and it takes a good deal of resolution at last to pack up camera and dark slide and proceed on one's way.

I am afraid I shall have a trouble to develop some of my Warnerke tissue, for, although I give good exposures, most of them have been given in the dense woods where the only light is the green illumination that penetrates the trees. The season has not sufficiently advanced to give me autumn tints, and the dark greens, therefore, will have to be forced a bit on development to give me contrast. But I am not at all nervous as to the results of my labours, for in the Tyrol last year, when I carried the roller dark slide and flexible emulsion tissue for the first time, I was perfectly well satisfied with the results. These some of my readers may remember to have seen when I exhibited them at the Photographic Society in February last, together with a lot of other dry-plate productions.

I have now completed my first roll of tissue, and have consequently made upwards of thirty exposures. I have just changed my exposed roll for a fresh one I had in my portmanteau, which, with a little adhesive paper, is soon made fast to the rollers. The roll of exposed tissue I have enclosed in two or three thicknesses of red paper and taken to the post office, whence, for the sum of sevenpence halfpenny, I am assured it will be safely conveyed to my residence in England.

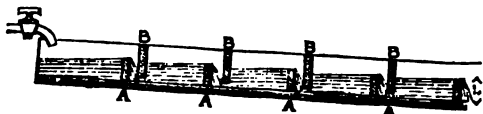
To-morrow I leave Eisenach to explore other portions of the forest near Schwarzburg, and will send you another letter in the course of next week.

ON A VERY SIMPLE WASHING TROUGH.

BY NELSON K. CHERRILL.

THE simple contrivance I am about to describe is one I have made for my own use, and will be found, I believe, as good as, or better than, many much more elaborate patterns. Should any of your readers think well of this, I should advise them to try one like it, as I am very fully satisfied with the work of mine.

The trough consists of a board some seven or eight feet in length, with two boards nailed on to the sides of it, the length being divided into a number of partitions, or cells, by pieces of wood, as shown in the cut. The drawing



shows the trough in section: the pieces A A A are about

three inches wide (i.e., high), and are nailed to the bottom of the trough; the pieces B B B are the same width, or, perhaps, a little wider, and are fixed right across from side to side, but so as to be quite clear of the bottom of the trough. The whole trough is placed at a slight angle, and the water simply runs in at one end from a tap, and out at the other into the drain.

It will be seen, on consideration of the cut, that the passage of the water through these little cells or divisions in the trough is on this wise. It enters at the upper side of the cell along the bottom of the trough, and runs over the top edge of the lower side of the cell into the well or division between A and B, whence it finds its way into the cell next below, and so on in through them all, entering each cell in turn at the bottom. Two or three stout pins stuck in the top of the dividing pieces A serve to prevent the prints being washed over into the wells, and so choking up the concern. I have provided a loose cover consisting of three pieces of braid, to keep out the dust, &c., as the trough is used out of doors.

I never place more than five or six prints in each cell or compartment, and I find that by being particular they do not stick together at the first; they get into the currents of the water as it flows, and keep on moving about all the time the trough is in action. I use as many of these troughs as are needed to take the prints done in the day's work, and I am quite confident that, in the morning, my prints are more free from hypo than they used to be when I washed them in a very ingenious but clumsy contrivance, with all sorts of water wheels and self-acting syphons and other complications.

It will be seen that in these troughs the water that washes the prints in first department or cell goes on to wash those in the next, and so on to the end; so that those in the lower part of the trough are washed in the washings of other prints. At first I thought this objectionable, but on careful consideration and experiment, I have proved that no mischief arises from this apparent shortcoming in the apparatus. I found, for instance, that a test solution being poured into the topmost box till it overflowed, and the water then being turned on, and the trough set in operation, the solution was carried through the trough, and expelled from all the cells, in less than ten minutes, so completely that not a trace of it could be found even in the last box.

I was induced to try some such plan of washing as I have here described from the exceedingly satisfactory results, as regards permanency, which I used to obtain when playing with photography as an amateur. I then washed the prints done in the day (perhaps two or three small views) in a saucer, under the tap in my father's back kitchen. Whether permanency depends upon washing, or not, I do not know; but I do know that the prints I washed in the manner described fifteen or sixteen years ago are as bright and good now as they were the day they were done.

I believe photographs (silver prints) done in this part of New Zealand are more permanent than is generally the case, and I can only trace the reason for this to the extraordinary purity of the water supply. There is not, I believe, another city in the world so well supplied with water. Every house has its own artesian well, and the water that comes up is so pure that you can make a nitrate bath with it without previous distillation, and that bath will work as well as any distilled water bath ever made.

A NOTE ON THE AERATION OF WATER.

BY NELSON K. CHERRILL.

It is said the trade of brewing can be only carried on with success in certain districts on account of its needing a peculiar quality in the water used. I should be sorry to

say that the effect produced on the processes of photography by the water used is so great in any case as absolutely to determine success or failure; but I am very sure that the quality of the water used has a great deal more to do with success and failure than many are prepared to admit.

The particular adverse quality in water I now speak of is "aeration," and a most peculiar quality it is. Much of the deep well (artesian) water in the South-East of England is so full of air-bells that a glass full of it will be found speckled all over with little air-bubbles if left standing for a few hours. These air-bubbles gradually increase in size till they become, in many cases, large enough to detach themselves and rise to the surface. In the two waters with which I am best acquainted in England—namely, those at Folkestone and Tunbridge Wells—this effect is so strongly developed that a glass plate left in a dish of water all night is, in the morning, covered on the under side with thousands of bubbles. With water of this class the greatest difficulty is found in avoiding failures in carbon printing, ceramic enamels, &c.

Let anyone whose practice of carbon printing shows a continual succession of small blisters, such as I see so much written about just now in the *News*, try this experiment:—Fill a deep dish with water from the tap, place in the bottom three stones or marbles, about half an inch in diameter, and on these lay a clean glass plate, so as to be about level and completely submerged. Let all this be done in the evening, and let all be left undisturbed till the following morning; then examine the glass very carefully, and notice if it be not covered on the under side with numerous small air-bells. If this be the case, let a second experiment be tried:—Take a piece of carbon tissue, and mount it in the usual way, with a squeegee, upon a piece of clean glass; when mounted, dry the glass and take it out of doors into the sunshine, and examine carefully the black surface of the tissue through the glass. If I err not, that surface will be found covered, more or less, with minute specks of clear silver lustre, quite invisible in the dim light of the dark room; but, when seen, sufficiently indicative of air-bells. These air-bells formed the greatest source of failure I have met with in working both the carbon and the enamel processes. In the one they "developed" with the print and marred its beauty, in the other they expanded in the heat of the muffle and split the film to a thousand pieces.

The only mechanical difficulty I met with in England, in doing the enamel process, was occasioned by this same splitting of the films. More than fifty per cent. of the enamels I did "split off" in the preliminary burning, and no process I could find would overcome the tendency, though at times it was much greater than at others. The water I am now using for photography has no tendency to aeration whatever. A glass plate left a week in it in the manner indicated above does not at any time show a single bubble, even when examined with a magnifying-glass. I fully determined this point long before I had any occasion to do enamels, having made up my mind that the splitting I referred to had been occasioned in the manner stated. I felt sure that it would not occur under my present circumstances. Acting upon this conviction, I threw the first enamel I made in Christ Church into the muffle in a manner which, at Tunbridge Wells, would have been looked upon as a conclusive proof of insanity; but the conjecture I had made was correct: no splitting of the film occurred, and I am now in a position to turn out enamels one after another without fear of failure.

There may be a moral in all this which will save some others from their troubles.

Cashel Street, Christ Church, New Zealand.

HEAT, LIGHT, AND ACTINISM.

We may apparently have heat without light, and light without heat. In the darkest room we cannot perceive vessels filled with boiling water, yet the warmth we experience on approaching them assures us that they are emitting radiations. Is not this heat without light? If we stand in the rays of the full moon, we cannot detect any increase of temperature. Is this not light without heat? It is true that in this latter instance we are mistaken as to the fact; but overlooking that—for the heat to be detected in the moonbeams requires the most sensitive apparatus—do not such observations assure us that heat and light are independent of each other, physical principles having an existence separate from each other?

Such were some of the arguments on which were sustained the hypothesis of the intrinsic difference of light and heat. In this no account was taken of the optical functions of the eye. Qualities were incorrectly attributed to radiations which, in truth, were due to peculiarities in the organ of vision.

The great service which the diffraction spectrum has rendered to science is the abolishment of all these imaginary independent existences—heat, light, actinism, &c.—and the substitution for them of the simpler conception of vibratory motions in the ether. The only difference existing among the radiations that issue from a grating, in the manner we have been describing, is in their wave lengths, or, what comes to the same thing, in their times of vibration. The diversity of effects produced depends on the quality of the surface on which they fall. If on a dark surface, and the more so in proportion to its blackness, they engender heat; if on the retina, they are interpreted by the mind as light; if on photographic preparations they produce decomposition, designated actinic effects.

Heat, light, actinism, are, then, not natural principles existing independently of each other, but effects arising in bodies from the reception of motions in the ether, motions which differ from each other in their rapidity. Of those that the eye can take cognizance of, the most rapid impart to the mind the sensation of violet light; the slowest, the sensation of red; and intermediate ones, the intermediate optical tints. Colours, like light itself, are nothing existing exteriorly. They are merely mental interpretations of modes of motion in the ether, and in this they represent musical sounds, which exist only as interpretations by the mind of waves in the air.—*Dr. John W. Draper, in Harper's Magazine for August.*

Correspondence.

PHOTOGRAPHY IN MELBOURNE.

DEAR SIR,—In the budget of *News* just handed to me on the arrival of the San Francisco Mail, I find the letter of your correspondent "Fife Atkinson," in which he comments rather severely upon my suggestion, made a year ago, in favour of the chances of a good operator in Melbourne.

I cannot suppose that the subject has much interest to your readers; at any rate, whatever interest it might have had at the moment, has passed, no doubt, ere this. Notwithstanding this, I must ask you to let me say a few words in reply. Corresponding at a three months' range between question asked and reply received, as we do between New Zealand and England, makes anything like a "discussion" quite out of the question. I will therefore reply as briefly as I can, and then let the matter drop.

Your correspondent takes exception to my suggestion on the ground that there are already thirty-seven photographers in Melbourne, and that most of these find it hard to "make both ends meet." Melbourne is a very large city.

I have no means of knowing the number of its inhabitants at the present time, but I find the population quoted in Haden's Dictionary of Dates as 100,000 in 1852. Supposing this to be correct, and also supposing that the population is not more now than then (a very unlikely supposition, I think) this would give, according to Mr. Atkinson's showing, about 2,700 souls in population to each photographer. This, I contend, is a large proportion. When I left Tunbridge Wells there were twelve or thirteen photographers in the district, containing less than 24,000 inhabitants. When I landed in this city there were twelve photographers among a population of only about 15,000, so that I do not think Melbourne is overrun yet with photographers. But your correspondent says those men can hardly "make both ends meet." Men have such different ideas upon this subject that it is hard to say much about it. A gentleman driving in a very nice "buggie" with a pair of horses was pointed out to me as one of the photographers whose name occurs in your correspondent's list. The photographers in Melbourne do not starve, any more than they do in other places, though perhaps none of them are making as much as they would like to make. Who does? I went into half a dozen of the studios in the city, and in all of them there was as much work going on as any one would expect to see in the middle of winter.

The impression I intended to convey in my letter, written just after my visit to Melbourne, was, that there was a good opening there for a really clever operator or two, who could introduce real novelties and improvements to the trade in the colony. There was, at the time I wrote, no one in the city doing either ceramic enamels, or carbon printing, or, as far as I could see, any of the beautiful and varied processes of opal printing, eburneum, mezz tint, Vander Weyde, &c. And if things are unchanged in the time since that was written, my opinion remains unchanged also.

All your readers must be aware that "things" are not very bright at present in any part of the world; trade seems depressed in most places; and when trade is low, photographers seem amongst the first to feel it. I have no means of knowing whether trade in general is better, or worse, in Melbourne, than when I wrote before.

Your correspondent mentions the case of one gentleman from England, who "set up" in Melbourne and failed lamentably, as a warning to all others who may be disposed to try in his steps. I do not know whether it is in very good taste to discuss the failure of this gentleman in the papers. He sailed from Melbourne a few days before I landed. I heard about him from dozens of people in the city (photographers and others), as there was much talk about it just at that time. All who spoke to me agreed in one statement, namely this: "He had plenty of work at the first." If this were the case, the failure was not attributable to want of support given by the Melbourne people to photographers, which is the point I wish to establish here.

One more word and I have done. Your correspondent says that there are only four photographers who keep any assistant at all in the way of operators, and that the wages of an operator average three pounds per week. According to this statement there are only about £12 per week paid out by the Melbourne photographers, all told, for the amount of skilled labour employed by them in the way of operators or skilled assistants. Does it look, I would ask, upon the face of it, that, if such be the case, a clever man would be able to make his way well there? That my friend who gave me the information as to what salaries were being paid to operators in Melbourne intentionally deceived me I will never for a moment believe, as he was a gentleman in a good position, and one from which he could gain no manner of advantage in misleading me, even had he wished to do so. Your correspondent gives the "lie direct" to my informant, but in so doing he has, as it seems to me, rather mended my case than spoiled it, for if among thirty-

seven photographers working among over 100,000 residents (many of whom are wealthy and almost all fairly well to do) there are, at present, only £12 per week paid out in wages to operators, it seems to me a "dead sure thing" that a really competent clever man, taking in a handful of novelties, would make way at once. My idea is, and always has been, that the fact of the work being done, makes the demand for it. I have always found it so. There is no demand for the good things of photography in Melbourne to-day, because the good things are not done there.—I am, sir, yours obediently, NELSON K. CHERRILL.

PS.—Since writing the above I am informed, but I cannot vouch for the truth of the information, that there are 175,000 inhabitants within three miles of the post office at Melbourne.

COLOURING PROCESSES FOR PHOTOGRAPHS.

SIR,—In your excellent leader upon this subject in the issue of September 7th, you very justly point out that the moment a transfer carbon process was invented by Mr. Swan, it was obvious that the gelatine image would lend itself to a certain style of artistic finish in colour, and this particular method of finish having been made the subject of one, if not more, patents recently obtained, we avail ourselves of the medium of your valuable journal to say a few words upon the subject. Whatever may have been the ideas of the original inventor of pigment printing, Mr. Swan, as to the applicability of colour to his invention, it is perfectly certain that his co worker and successor in the effort to render the invention commercially practicable, Mr. J. R. Johnson, was fully alive to the importance of the judicious application of colour to the back of the gelatinous carbon image.

Not only was this the case, but he showed that it was so by including the method for producing in colour most excellent results in his patent dated February 3rd, 1869, the following being his description of the *modus operandi* :—

"5. My fifth improvement consists in another mode of transferring the picture in one or many parts from its temporary to its permanent support for the purpose of being painted upon in oil or being varnished. I mount the picture in this case upon paper rendered transparent by wax, paraffin, or any fatty matters not fusible at the temperature used for developing the gelatine pigment prints. When the developed print is quite dry I varnish the surface of the permanent support which is to receive it, such as wood, panel, or oil canvas. I varnish also the face of the picture, and if of several parts, I carefully match these. The two varnished surfaces, when nearly dry, are then rubbed down together, and when in perfect contact the back of the waxed paper is warmed, and then leaves the pigment film perfectly attached to the panel or canvas. Before the picture is transferred it may be tinted or painted, and if painted with opaque colour it may be laid over another picture without the latter being seen. Thus I form composition pictures by laying down a landscape background, for example, upon the canvas, and upon it I place figures trimmed to their contours, and which have received a coating of white or coloured opaque varnish at the back. These then show as perfect forms without the landscape or other background interfering, and as the gelatine film is extremely thin the superposition is not visible."

Here, then, eight years ago, we have Mr. Johnson describing a method by which carbon prints are painted or tinted whilst still on their temporary support; after being treated with colour the picture is coated with a varnish, the permanent support being also varnished. The two surfaces are rubbed down together, and upon the removal of the temporary support the picture shows as a coloured work, the photograph in gelatine being imposed upon the colour behind it. To say the least of it, this is marvellously like the claim made by Monsieur Rousseau in his patent

dated October 24th, 1876, and printed in *extenso* by you last week.

There is yet another method of colouring photographs, producing very charming results, and which seems to be in danger of being claimed exclusively at the present moment. This method is well known, and has been extensively practised both in this country and in America. It formed the subject of a patent taken out so long ago as the 23rd of September, 1852, by M. Tardieu, who describes it as "Certain Improvements in the Colouring of Photographic Images." M. Tardieu says:—"The paper photograph, after being varnished, is mounted either on a frame or on a sheet of glass. Oil colours are preferred to be used; they are laid on at the back of the photograph thus rendered transparent, the transparency of the paper permitting the colours to appear in all their brightness on the paper side of the photographic image." In ignorance of this patent Mr. Duppa takes out a patent just one year later, in November, 1853, for "Improvements in Colouring Photographic Pictures." He thus describes his invention: "These improvements consist of rendering the front surface of photographs transparent with suitable varnish, and applying colours to the back surfaces, by which means the laying on of the colours will not require that artistic skill heretofore necessary, and results are obtained which cannot be obtained by the colouring on the front surface." He goes on to give full directions for rendering the paper translucent by means of wax, mastic, or other varnish, and given directions for colouring in oil.

In the same year a Monsieur Laverdet obtained provisional protection only for a method of colouring photographic pictures, "so as to give them a life-like or natural appearance, without impairing the exactitude of the photographic image, &c." He describes the method as rendering the photograph transparent "by coating the back with varnish, and causing it to penetrate the pores of the fabric containing the picture." When the varnish is dry, oil colours are laid on the back of the picture, "so as to imitate as closely as possible the natural tint of the object represented." Since that time patents have been taken out both in this country and America, notices have appeared in the journals and almanacs bearing upon cognate methods of colouring photographs, the gist of the whole matter being that the photographic image shall be superimposed upon the colour underneath.

As producers of coloured photographs by both of these methods, we think it expedient to clear the ground by calling the attention of your readers to what have been patented and published with respect to them, and also to secure to licensees any advantages there may be in methods published in the patents of THE AUTOTYPE COMPANY.

SOLAR CAMERA ENLARGEMENTS.

DEAR SIR,—Your leader of last week upon this subject conjured up a vision of bye-gone troubles that made such a vivid impression on me at the time that they will never be forgotten. 'Twas in the days of "Woodward's Solar Camera," and I, bursting with eagerness, invested what in those days was to me a very important sum. Alas! I found it was in an evil hour—the delays, the loss of time, the disappointment to customers, the worry and anxiety of that solar camera will never be forgotten by me. Prints on albumenized paper were produced now and then. Sometimes a bright sunny day would turn out a crop of respectable prints, but there were so few of them.

If anybody wants to know how few fine sunny days there are in a year, let him buy a solar camera. In this climate of ours the thing is absolutely impracticable. No doubt there are a few fine days upon which a certain amount of work could be done, but as a matter of business to a professional photographer, direct prints on paper or carbon tissue are, not to be done.

Again, a certain class of negative will do very well with a solar camera; but how about the dense ones or the thin ones? You have no control whatever over the result. If, on the contrary, you make your negatives from small positives—say albumen or carbon—you can achieve results which are impossible with the solar camera. For instance, you can "dodge" your positive in printing; you can retouch it, when it is printed, to any extent; you can put in shadows and detail where they are wanted. Then the enlarged negative is equally susceptible of treatment in the other direction. For landscape work you can combine skies with the most charming effect. And all this you can do with ordinary daylight, and in the depth of winter, and on the gloomiest of November days. The oxy-calcium light will be obedient to your will, and give you excellent results.

I think, Mr. Editor, you will see that, to say nothing of the absence of sunlight, which is in itself fatal to solar camera work in England, the balance of advantage is by far in favour of the enlarged negative process; and, as a very old and not unsuccessful practitioner, I hope you will allow me to say my say about solar camera enlargements.

MAGDUFF.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY'S EXHIBITION.—In our advertising columns this week will be found particulars of the Society's Exhibition, to be inaugurated by a conversation, open to members and their friends, at 8 p.m., on Tuesday, October 9th. Special note should be taken by intending exhibitors of the condition that their pictures must be sent to 5, Pall Mall, not later than October 2nd.

CLOUD NEGATIVES.—We have received from Staff-Sergeant Perry some photographs illustrating the quality of the cloud negatives he is publishing. Practically, a good sky is the making of a picture, when in the absence of such a sky a mere diagram of the subject would have been presented, and we commend these sky negatives to our readers.

NOTE-BOOK FOR LANDSCAPE PHOTOGRAPHERS.—Every photographer who has spent a day or a few hours in the country with the camera has felt how much the interest of the pictures was increased by the preservation of a record of all the circumstances of their production. Messrs. Piper and Carter have just brought out a note-book for the preservation of such memoranda. Here are headings and columns for number, date, light, process, lens, stop, seconds, time of day, and general remarks, all under the general heading of the day "name of place." No recommendation from us is necessary to point out the advantages of such a note-book.

PHOTOGRAPHING PLANS OF PARIS.—"In compliance," says *Nature*, "with a suggestion from M. Engelhard, a member of the Municipal Council of Paris, the Prefect of the Seine has ordered photographs to be taken of every existing plan of the City of Paris, so that it will be possible to see all the series of transformations experienced by the city from the most remote period when such plans were made up to the present time."

A HORSE PHOTOGRAPHED AT FULL SPEED.—"Mr. Muybridge," says the *Daily Alta California*, "sends us a copy of an instantaneous photograph of 'Occident' taken when he was trotting at a speed of thirty-six feet per second, or a mile in two minutes and twenty-seven seconds. The negative was exposed to the light less than one-thousandth part of a second, so brief a time that the horse did not move a quarter of an inch. The photographer had made many experiments to secure the highest sensitiveness and the briefest possible exposure, and the result was a novelty in photographic art, and a delineation of speed which the eye cannot catch. At 2:27 the spokes of a sulky are invisible to the eye, as they spin around so fast that, taken separately, they are not distinguishable. The photograph shows each plainly, without blur. The negative was retouched before the photograph was printed, but we are assured that the outlines are unchanged; and we can well believe this, for much of the work has a character that

could scarcely be secured by hand. Mr. Muybridge intends to take a series of pictures, showing the step of 'Occident' at all its stages, and in this manner, for the first time, the precise differences in the motions of different horses can be clearly represented—a matter of much interest to horsemen, for trotters vary in their action, one having his fore leg straight when it touches the ground, another crooked, and so on. The following letter from Mr. Muybridge will be read with interest:—San Francisco, August 2nd, 1877. EDITORIAL ATTA.—When you did me the honour of asserting to Gov. Stanford your confidence in my ability to make a photograph of "Occident" while he was trotting at full speed—providing I could be induced to devote my attention to the subject—I will candidly admit I was perfectly amazed at the boldness and originality of your proposition. Having, however, given my patient devotion to the task the Governor imposed upon me, and instituted an exhaustive series of experiments with chemicals and apparatus, it affords me pleasure to submit to you a proof that your flattering confidence in the result of my endeavours was not altogether erroneous, and I herewith enclose you a photograph made from a negative which I believe to have been more rapidly executed than any ever made hitherto. The exposure was made while "Occident" was trotting past me at the rate of 2·27, accurately timed, or thirty-six feet in a second, about forty feet distant, the exposure of the negative being less than the one-thousandth part of a second. The length of exposure can be pretty accurately determined by the fact that the whip in the driver's hand did not move the distance of its diameter. The picture has been retouched, as is customary at this time with all first-class photographic work, for the purpose of giving a better effect to the details. In every other respect the photograph is exactly as it was made in the camera.—I am, yours faithfully,

"EDWARD J. MUYBRIDGE."

COMMENTS.—A cement for uniting metallic to non-metallic substances is composed of thin-made glue, mixed to the consistency of thick varnish with wood ashes. The ashes should be added gradually to the glue during ebullition, with constant stirring, and the cement should be used hot. A strong mucilage, capable of fastening wood or porcelain and glass together, is made of 8½ ounces of strong gum-arabic solution, to which a solution of 80 grains sulphate of aluminum dissolved in ½ ounce of water is added.—*Scientific American.*

To Correspondents.

J. BULLOCK.—We do not know of any efficient method of restoring the sensitiveness of old, rotten, insensitive collodion. The addition of zinc filings will remove the red colour, but it does not restore the sensitiveness. The only addition we have found as any good is a little bromide of cadmium. This improves matters, but it does not make the collodion equal to a sample in fairly good condition. The best purpose to which you can apply it is to add to new unripe collodion which has a repellent film, disposing it to matt silver stains, or to fog. It is often useful for this purpose, and also for cleaning plates.

J. T. D.—We do not know of anyone who supplies the class of pictures you mention of cards of any class at the rate of 4s. a gross. It is possible that some of the photo-mechanical prints used for decorative purposes may be possibly supplied at such rates; but we do not know the producers. We cannot see that it would be possible to supply silver prints card size at the rate of fourpence per dozen.

H. B. (Peckham Rye).—We fear that we cannot give advice of much practical value, except so far as it may be cautionary. It is difficult to make photography profitable without giving yourself up to it, and practising it as a trade. So far as we have been able to observe, it is difficult to make it profitable if practised as an amateur. Portrait photography is, as a rule, the most profitable branch, and the most easy to acquire a connection in; but you must be prepared to work for the public when they desire it, not simply when you choose. Landscape work would be most easy to undertake as an amateur; but it requires very good work, and, if possible, some speciality of subject or treatment to find a market for landscapes. If you have examples of your work, call on Messrs. Marion and Co., of Soho Square, who are large publishers of photographs, and ascertain from them if your pictures are likely to sell, or if they will undertake to publish them.

C. SMITH.—Your lens must indeed be bad if the bad definition is not improved by a stop. It is bad for even a "common French one," as you describe it. Get rid of it at once, and get another, bearing in mind that a low price does not always include cheapness. Get one, if possible, by one of the good English makers. If your finances are limited, you may get a good one second-hand at a reasonable price.

ENTHUSIAST.—It is somewhat difficult to convey in words the exact depth to print before toning. The rule is to print a little deeper than you wish the finished print to appear. Experience is the best guide, and that is soon acquired. Bear in mind, however, that there is a difference in baths as to the extent to which they bleach or reduce the depth of the print. A new gold bath generally reduces more than an old one, and some baths scarcely reduce at all. There is sometimes also a difference in the extent to which different samples lose depth in toning and fixing. Observation here is your only guide.

G. E. WALES.—We regret that we do not see how we can efficiently help you. We publish a process by which others produce very charming pictures with very short exposure. You try the same process, and state that you are careful to follow instructions, but you fail to get anything but a very poor negative with very long exposure. We can only come to the conclusion that you deviate in some way from the instructions; but it is impossible for us to tell in what point. The possibility of your coffee being adulterated with chicory is doubtless a circumstance of note. Get coffee berries and grind them yourself, and try again with greater care and precision.

FRED WARNER.—There is no method of restoring a distempered background except recolouring it; and unless the colour already there have been well fixed with size, it is in danger of working up. It may be well to treat it first with a good size of glue, applied warm. Then mix a grey tint, using whitening reduced to the proper colour by the addition of black or brown umber and a proper quantity of size. Apply gently with a large brush; but remember that distemper colours require considerable skill to apply quite evenly.

NONPLUSSED.—The dirty, yellow, 'spotty, and mottled effect of your prints is due to imperfect fixation. This may arise from the use of an old exhausted fixing bath; or from a very weak fixing bath; or from too short immersion; or from the prints sticking together and not getting properly in contact with the fixing solution. A hypo. bath should never be used for more than one batch of prints. It should consist of hypo one part, to water four or five parts, and the print should be immersed for about fifteen minutes, and kept moving, so that it is thoroughly exposed to the action of the solution. 2. Oyster-shell markings are almost invariably due to one cause; namely, the use of a horny repellent collodion. When the collodion is a little older the tendency will disappear. Adding a drop or two of distilled water to each ounce of collodion, and shaking well, will sometimes effect an improvement. Immersing the bath before it is too well set is a good thing. Keep the inner frames quite clean, and place wet blotting-paper at the back of the plate. Always develop as soon as possible after the plate has left the silver bath. If you have a little of an old somewhat rotten sample of collodion to add to that in use, it will improve matters.

FRANK BUSHNELL.—An assistant may become a member of the Photographic Society.

BROMO.—We have not ourselves made comparative trials; but so far as our information goes, B is undoubtedly preferable in all points.

HOWARD W. ANDREWS.—The film dissolving on being varnished is due to the quality of the collodion. Some samples when new, and others as they grow old, have the quality of being soluble in alcohol, of which the varnish is made. The remedy is to give the film a coating of gum, gelatine, or albumen, very dilute, and drying before applying the varnish. The albumen or other coating may be applied to the wet negative before drying. Write to the gentleman in question and ask: we do not know of any other way.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. H. POWERS, Brighton,
Photograph of a Cat with Fool's Cap on its Head.
Photograph of a Lady with Two Cats on her Shoulders and Three in her Arms.
Photograph of a Cat with a Pen Touching a Kitten.
- Mr. J. BUSHNELL, Birmingham,
Three Photographs of W. E. Gladstone, M. P.

The Photographic News, September 29, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.
A PHOTOGRAPHER IN LUCK—PRIVILEGES OF PHOTOGRAPHERS
IN FRANCE.

A Photographer in Luck.—Photographers, like everybody else in this world, have their good and bad luck; and when they do get a stroke of good fortune it usually springs from very little. A travelling photographer, a few days ago, making a tour around Paris, came to Saint Germain, and began work in the place with his modest apparatus and appliances. Country operators of this class usually understand business, and generally succeed when they make application. Perhaps it is a pony-carriage just starting off to give the young ones an airing, and Paterfamilias is only too delighted when the stranger comes up and proposes to take a picture of the group then and there. Or, may be, there is a tennis party on the lawn, or afternoon tea going on *à la française*, and under these circumstances the travelling photographer is sure to be welcome when he makes his application. The whole matter is treated as a joke—as a good bit of fun—by those interested, but they are not on that account less anxious about the result. The photographer, if he is a plausible man and well up to his work, makes a very good thing of it in the end, for the chances are he secures a very charming little picture indeed. There has been no preparation, no fuss about the affair, and the photographer has made his appearance just at the nick of time. Everybody is delighted, and none less, probably, than the photographer himself. In the instance to which we have alluded, the photographer on the look-out for work not unnaturally proceeded to the pretty villas, of which so many abound in the suburb of St. Germain, and in time came to the Pavillon Henry IV., on the terrace of which was an old gentleman walking briskly to and fro for his morning constitutional. He was picturesquely clad, with a big muffler round his neck, his round, chubby face, though somewhat lined and furrowed, being still ruddy with health, while a pair of bright eyes, not a bit impaired by age, looked sharply through a pair of spectacles. The gentleman had a kindly, good humoured expression, and the photographer had no hesitation, therefore, in asking to be allowed to take a portrait, with the terrace as a suitable foreground. Camera and plate were ready in a trice, and the old gentleman posed himself without more ado, the result being a very characteristic portrait and a good picture. Next day, before our friend had time hardly to print a proof for his patron, the latter died, and France had lost its grandest politician, the first President of the Republic, the liberator of its territory. M. Thiers had died suddenly, and the photographer's last picture of the great statesman bide fair to realise a small fortune. It is a carte picture, and is priced at two francs, and is said to have enjoyed an enormous sale on the day of the funeral and subsequently. It is this photograph which was reproduced by the *Illustrated London News* a fortnight since, and which many of our readers have doubtless seen. It represents the octogenarian ex-minister hale and hearty, and apparently in sound health, on the terrace of the Pavillon Henri IV.; and fortunate, indeed, are our Gallic neighbours to have so striking a likeness of their beloved first president. A picture was also taken, with the camera, of the deceased lying in state in the chamber of death; but this, though of interest to many, does not, as a matter of course, command the great sale which has attended the little carte-de-visite photograph of the travelling operator.

Privileges of Photographers in France.—The French Government evidently does not mean to take half measures in regard to the regulations it recently issued for photographing the State collections in museums and galleries. Further particulars are now announced, and the direction of affairs has been given over to a well-appointed Commission, among whom are to be found the names of MM. Davanne, Almon-Girard, and St. Clare-Deville. To this

Commission will be entrusted the consideration of all questions likely to arise, and all applications made by photographers and others to avail themselves of the privileges just accorded. These consist, our readers may remember, of permission to take photographs at all public galleries throughout France, on one condition—that the use of dry plates is strictly adhered to. Hitherto, it is said, the refusal to admit photographers to the galleries was based upon the supposition that they might injure the apartments with their chemicals, or inconvenience the general public with their apparatus, &c. But now that dry plates have arrived at such a state of perfection there is no reason any longer for the photographer to bring anything with him but camera and plates, and the spilling of liquids is an impossibility, since no operation beyond those of focussing and exposing are to be performed inside the building, except under very special and exceptional circumstances. To meet the latter contingency some of the galleries are to be fitted with laboratory and dark room, where work may be conducted with every facility; but it will be only privileged individuals who will be permitted to use the appliances. It will be a long time, we expect, before the authorities of the British Museum, National Gallery, and Royal Academy accord such privileges to British photographers, or that a photographic studio will be erected in some handy corridor near the galleries. In France the regulations are briefly these. The photographer makes application to reproduce this or that picture or object of interest, and gives his reasons why such reproduction is really called for. If the application is a *bona fide* one, and reasonable—for some discretion must naturally be exercised—the photographer is informed that his request is granted, and that if he gives an undertaking to conform to the regulations, he may commence work at once. In return for the privilege accorded him, he must deposit with the Commission a duplicate negative of everything he takes, together with a couple of prints, and these negatives and pictures become the absolute property of the State. They are taken in charge by the Commission, and by it sent to a central photographic establishment, where they are preserved or printed as may be deemed necessary. This central photographic establishment has, however, other duties to perform beyond that of printing and registering the negatives it receives from those who work in the galleries. Its officers are to superintend and overlook any photographic operations undertaken in State buildings by private photographers, and are, moreover, to furnish instruction to those who may be engaged in Government work. Thus when the State undertakes, as in the case of the recent Transit of Venus observations, to make records of its own, instead of instruction being given in private studios, it will be imparted in the central photographic laboratory of the State, where the pupils will have every facility given them for practice and study. And when we bear in mind that such instruction will be imparted under the auspices of such men as Davanne and others whom we have mentioned, it certainly goes without saying that every scientific improvement and novelty will have due attention. To-day, more than ever, do we require the aid of scientific men to help us on, and to guide us safely through the difficulties and obstacles that beset, in a greater or less degree, the carbon process, the emulsion process, and other methods that are rapidly serving to perfect photography. We trust that beyond its other duties the central State laboratory may do something towards undertaking scientific investigation and research with a view to the progress of our art.

M. DAVANNE ON EMULSION PROCESS.*

By reason of the success and incontestable advantages presented by the emulsion process, I think it may be

* *Bulletin de la Société Française.*

interesting just now to point out some faults that may arise from impatience, inexperience, or, by chance, in the preparation and treatment of the plates. Such defects I myself have met with, and have sought to overcome by various means.

Granted the employment of good materials, it has nevertheless happened to me, in sensitizing the bromized collodion, and in the production of the emulsion to obtain the formation of a partial precipitate of bromide of silver, giving a pasty emulsion of bad appearance and bad qualities, instead of a product presenting, by transparency, the orange colour which is the indication of the molecular division which it is sought to bring about. This result was due, no doubt, to my impatience, which caused me to add too rapidly the alcoholic solution of nitrate of silver to the bromized collodion, M. Chardon telling us explicitly that the addition should be made by degrees, and with a good deal of agitation. I got over the difficulty, as M. Andra has pointed out, by pouring the bromized collodion into the nitrated alcohol; but being, perhaps, rather too sparing of my labour, I did not agitate enough to obtain perfect division.

I then had an apparatus of this kind constructed, which gave me very good results.



I make my solution of nitrate of silver in alcohol in a glass bulb which is stoppered by a perforated cork. Into the perforation is put a glass tube, which protrudes from the cork some four or five centimetres. Inside the bulb the tube is flush with the cork, and the latter is of such a length that, when the bulb is turned upside down, the cork, E, is capable of fitting into the mouth of a bottle. The end of a glass tube, which protrudes, is drawn to a thread. When the bulb has been mounted by means of the cork, upon the bottle, the only means of communication is through the finely-drawn tube, and the atmospheric pressure does not allow the liquid from the bulb to fall unless a vigorous shaking takes place. Every time the apparatus is agitated, a little of the alcoholic solution of nitrate falls, and in this way the emulsion is formed little by little under the best conditions. In my former operations, emulsion I made deposited more or less bromide of silver in a few hours, while that now produced in the manner indicated, if allowed to stand four-and-twenty hours, shows no trace of deposition, so finely divided are the particles.

The formation of pasty bromide of silver is the principal cause, although not only the only one, of the matt, porcelain appearance assumed by emulsion plates on drying. Such plates are not altogether bad, for good results may be secured with matt films. At the same time an inspection with the magnifier shows a more decided grain than that of plates having a polished surface.

In the experiments I made, the same emulsion which gave me matt surfaces was also competent to give me brilliant films. It was only necessary to let the pro-

duct remain for twenty-four hours. The pasty—or rather chalky—bromide of silver is precipitated to the bottom of the bottle, while the very finely divided compound remains in suspension, and by means of a simple decantation, followed by filtration through cotton-wool, I have obtained surfaces as brilliant almost as albumenized collodion. But in this case the film became impoverished; its sensitiveness remained about the same; but on development there was an absence of vigour in the impression, and when it came to pushing the alkaline development, the picture seemed to become weaker rather than stronger. This last effect is due, not to a diminution in the vigour of the blacks of the negative, but rather to a fog, which, on development, is produced in the clear parts, and which tends to render the whole surface universally covered with a silver deposit.

A very simple method of obtaining, in these circumstances, the necessary vigour, consists in following the alkaline development with an acid development, an operation well known to all. As soon as the image is seen in all its details after treatment with alkaline solution, it is washed with water, and then there is poured upon it:—

Water	...	...	1,000 cub. cents.
Gallic acid	...	...	3 grammes
Pyrogallic acid	...	...	3 "
Crystallized acetic acid	...	...	15 cub. cents.

The acid saturates every trace of alkali still remaining after washing, and the former is then poured back into the developing cup, a little nitrate of silver solution of three per cent. strength being added; this mixture is poured over the plate again, and the same closely watched as it waxes in intensity, until at last there is produced a very thin image, but possessed of brilliancy and sufficient vigour.

I may remark here that it is well, if not actually indispensable, to wash the surface of the plate with alcohol before proceeding to development; the difference in sensitiveness may be estimated probably at a hundred per cent. A pose of thirty seconds was found amply sufficient with a lens with small diaphragm when development was preceded with washing by alcohol, while I could scarcely obtain the same result with a minute's exposure when I did not flow the film first of all with alcohol.

The alcohol, dissolving the quinine, renders the film at once more permeable, and allows a deeper action of the reagent when these are applied, and this accounts for the greater sensitiveness exhibited. The application of the alcohol, although but an accessory, should be done with care, for if the quinine does not dissolve equally, or if it is again precipitated on washing, because the alcohol would be saturated, or if the plate still maintains its greasy appearance, the contact of the developer will not be uniform, and patches or inequalities will arise, which will militate against the purity of the image.

Finally, it must not be taken for granted that emulsions which have been exposed to light are of no value. It is neither wise nor economical to throw away such as do not give good results. Experience has proved to me that an excellent use may be made of these products, of which I had at one time very nearly a litre, the result of many experiments. Applying the principle that in the presence of soluble bromides or iodides the bromide and iodide of silver have no sensitiveness, and that they lose even under the influence of light the action which the latter would produce if the salts were sensitive, I added to my bottle of residues a few cubic centimetres of bromized collodion, and to be more sure about annulling all previous action of light, I put in a drop of pure bromine for every one hundred cubic centimetres of liquid, the drops being first of all dissolved in a little alcohol. I exposed the whole in the open air, and after a repose of some hours I decanted the emulsion, and precipitated it with hot water. The product, when dry, and treated like other emulsions, gave me very good results.

THE DISCOVERER OF TALBOTYPE.*

MR. W. H. FOX TALBOT, F.R.S., of Laycock Abbey, Wiltshire, whose death was recorded in our columns on Friday, as having happened on Monday, September 17, at his country residence, at the age of seventy-seven, was the eldest son of the late Mr. William Davenport Talbot, by his marriage with Lady Elizabeth Theresa Fox-Strangeways, eldest daughter of Henry Thomas, second Earl of Ilchester. He was born in February, 1800, and received his early education at Harrow, then under Dr. Butler, afterwards Dean of Peterborough, the father of the present head master. In due course of time he was removed to Trinity College, Cambridge, where he gained the Porson Prize for Greek Iambic verse in 1820, and took his degree in the following year as Chancellor's Medallist.

He does not appear to have been called to the bar, or in fact to have followed any learned profession; but he took a delight in chemistry and in chemical experiments, with which he combined a zeal for archæology and antiquarian studies. Elected as a Liberal for the borough of Chippenham at the general election which followed on the passing of the first Reform Bill, he held his seat for two years, but then withdrew from political life. His motives for so doing we can gather from his own writings. Mr. Talbot tells us, in his "Pencil of Nature," that in the month of October, 1833, when trying to sketch the scenery along the shores of the lake of Como, by the aid of a camera-lucida, and wearied by many successive failures, he was "led to reflect on the inimitable beauty of the pictures painted by the hand of nature, pictures which the glass lens of the camera throws upon the paper in its focus," and further "to consider whether it would be possible to make these pictures permanent." He was aware that paper might, by chemical means, be made sensitive to the action of light, and he resolved to try and follow up the idea by experiments. By a long and elaborate course of these experiments, which it would be useless now to enumerate in detail, he had nearly arrived at a result satisfactory to himself, when he read one day in a scientific journal that his own solution of the mystery had been, if not anticipated, at all events rivalled, by the parallel researches of M. Daguerre. To use his own words, "An event occurred in the scientific world which in some degree frustrated the hope with which I had pursued during nearly five years this long and complicated but interesting series of experiments—the hope, namely, of being able to announce to the world the existence of the new art, which has since been named photography." This was, of course, the publication of an account in January, 1839, by M. Daguerre of what was termed the Daguerreotype process after its discovery. Mr. Talbot lost no time in communicating to the Royal Society the details of his own independent process, which he called at first photogenic drawing, and afterwards calotype. Sir David Brewster, however, perceived at once its value and importance, and therefore proposed that it should be called Talbotype—and the name was to some extent adopted, until, with the full consent of its modest discoverer, it became popularly merged in the more comprehensive term of photography.

The two rival processes, though one in their design and object, differ very largely in matter of detail. As a writer in the *English Encyclopædia* observes:—

"In Daguerre's process the image was produced upon metal plates; in that of Mr. Talbot the same image was obtained upon paper, and neither the one nor the other could claim to be the first who had obtained sun-pictures upon a surface previously rendered sensitive, the principle having been perceived and announced by Thomas Wedgwood in his 'Account of the Method of Copying Paintings upon Glass, with Observations by Sir Humphrey Davy,' which was published in the 'Transactions' of the British

Institution as far back as 1802, and later by M. Niépce, who had made known in London in 1827 his own experiments in obtaining sun-pictures. But in none of these was the image either distinct or permanent; so that M. Daguerre and Mr. Talbot were the first to apply the principle practically, and from them the photographic art may be said to date its origin. It is probable that this statement does justice to all who were concerned in this discovery, both theoretically and in the application of theory to practice."

Mr. Talbot's invention, however, remained for some months in a very imperfect state; and it was not till the autumn of 1840 that he made the discovery which "laid the foundation of the photographic art in its present form"—namely, that sensitive paper, during the first few seconds of its exposure to the light, receives an invisible image perfect in all respects, and that, in order to render the image visible, it is sufficient to wash the paper over with gallic acid, or with some other astringent liquid. In 1842 Mr. Talbot was presented with the gold medal of the Royal Society in recognition of the part which he had taken in the discovery of photography. Already—namely, in 1841—he had taken the necessary steps for securing to himself, by patent the commercial profits which were likely to accrue from this novel use of the sun's rays; but upon second thoughts, and becoming convinced of the various public and private uses to which the art might be made subservient, and at the request of several members of the Royal Society, he consented to forego the profitable privilege, and to throw open to the public his discovery, with what results is known now to all the world, with one single reservation—that of taking portraits. This, however, he afterwards waived, the legal question having been raised, and somewhat unsatisfactorily decided, in one of the superior courts.

In 1851 Mr. Fox Talbot presented to the Royal Society, and also to the Académie des Sciences at Paris, an account of sundry further experiments which he had made in the direction of obtaining instantaneous photographs; and two years later he published a notice of some successful experiments in the application of photography to the work of engraving on steel plates.

Of late years Mr. Fox Talbot employed much of his time in the study of languages, and especially in the work of deciphering the cuneiform inscriptions on Assyrian monuments. He was also the author of several valuable works, such as "The Pencil of Nature," quoted above; "Legendary Tales;" "Hermes, or Classical and Antiquarian Researches;" "New Arguments of the Antiquity of the Book of Genesis," and "English Etymologies." He also contributed largely to the papers read at meetings of the Society of Biblical Archæology, and of other learned Societies.

Mr. Fox Talbot married in 1832 Constance, youngest daughter of the late Mr. Francis Mundy, of Markeaton, Derbyshire, by whom he has left a family to lament his loss.—

A GLANCE AT PHOTOMETERS.*

ARITHMETICAL PHOTOMETER.

To carbon workers, the very first thing needed is a photometer—a photometer in every way reliable and trustworthy—as a certain and sure guide in printing, for nothing can be known of the pigment picture until it is developed. Then a glance tells the story of failure or success. If under-exposed, there is no help for it; if not much over-exposed, we are often told that hotter water will bring it down. This it will do, but the harmony is destroyed, and no one who works conscientiously, or is careful of his reputation, will turn out such pictures. The carbon process is a very exacting one in almost all of

* *The Times*.* *St. Louis Practical Photographer*.

its details of manipulation, and in nothing more so than in precise and exact exposure. Anything less or more than "just right" is failure: and after a practice of ten years in pigment printing, I have never found a remedy for either defect which I can conscientiously introduce to the photographic brotherhood. There are many ways of reducing an over-exposed print, as almost all are aware of; but, as I before said, this is only accomplished at the expense of the harmony of the picture. So that it would seem from the foregoing that exactness of exposure is imperative. And so it is.

A great bar in the way of hitting off just the right exposure is the photometers commonly used, which are little better than guess work, and are the cause of uncertainty, and consequent failure, waste of precious time and costly material.

During the past five years I have made and used photometers to regulate the exposures in pigment printing on various principles as proposed in the different photographic publications from time to time. I have tried all that have come under my notice, with the single exception, perhaps, of the one named to me to be the best.

WILLIAM HENRY FOX TALBOT, F.R.S.

It is somewhat difficult to realize that an art which has taken such deep root in almost every department of art, science, and industry—in aiding research and investigation, in easily and rapidly producing unchallengeable records, superseding largely painting, engraving, and lithography—is still so young that many of its progenitors are still alive. The actual inventor of photography has just died. A couple of lines in the Obituary of the *Times* of Saturday last briefly announces: "On the 17th inst., at Lacock Abbey, Wilt., William Henry Fox Talbot, Esq., F.R.S., in his seventy-eighth year." Experiments in delineating objects by the action of light on substances sensitive to its chemical action had been made before by various persons. Wedgwood and Davy had been in some degree successful. Niepce had been still more so, but not sufficiently to give a practical process to the world. But Talbot, contemporary with Daguerre, and slightly preceding him in a detailed announcement of his method, invented a practical process of sun drawing, a development of which is in practice in the present day.

William Henry Fox Talbot was of patrician descent, being descended on the maternal side from the Earls of Shrewsbury. He was the son of W. D. Talbot, of Lacock Abbey, in Wiltshire. He received his education in boyhood at Harrow School, and subsequently graduated at Trinity College, Cambridge, where he won two university prizes. In the first reformed Parliament Mr. Fox Talbot sat as member for Chippenham. Politics did not, however, entirely absorb his attention, for within a couple of years, in 1834, we find him making his first experiments with the chemical action of light, which in the course of a few years brought forth very definite results. On the 31st of January, 1839, he read a paper before the Royal Society on what he then termed "Photogenic Drawing." The operation consisted in treating writing-paper with a solution of common salt, and subsequently with a solution of nitrate of silver, forming, by the now well understood reaction, chloride of silver, on the surface of the paper. Lace, leaves, ferns, and similar objects laid upon this paper, and the whole then submitted to light, produced white images of the objects, which served as negatives on a dark ground produced by the action of light on the uncovered surface. This facsimile was so marvellously accurate that it excited universal admiration, and its simplicity, ease, and rapidity were regarded as marvellous. A copy which, as the paper which appears in the "Transactions" of the Society remarks, "would take the most skilful artist days or weeks of labour to trace or copy, is effected by the boundless powers of natural chemistry in the space of a few seconds."

thirty-two minutes, No. 6 in sixty-four, and No. 10 in eight to show the theory of a perfect exposure.

Now, the above-described thing like this. The number of the numbers increase with proportion, as shown in the O.C.D., and I may say here from data obtained from experiment and verified, made against a photometer which never will give the directions to a

On the vertical line to the of exposure of the different equal parts. From these lines are projected, and a line from the photometer points through which the which of the year 1841 he haducing camera impressions, could be printed by his method.

method, which he patented, was a type—a complete and perfect process, the analogue of the photography day. In this process iodide of silver was used, and gallic acid the developing agent. The collotype process was largely practised by the photographic amateurs, and, in skilled hands, produced perfect results as we have seen by any other method, notwithstanding the great advances which have been made in the art. The use of paper for negative superseded, however, by collodion in 1852. Shortly after this Mr. Talbot was sufficiently ill advised to bring an action for infringement of his patent against a photographer using the collodion process, on the score that the film of iodized collodion was the equivalent of a film of iodized paper. In this attempt, however, he failed, in the great trial Talbot v. Laroche, decided in favour of the defendant. It is right to add here that in 1852 Mr. Talbot made a present of his process to the public, reserving patent rights only in its application to professional portraiture. He had previously given permission to use his patented process to a few amateurs, whose skilful labours not only gave credit to the process, but helped to perfect it. Chief among these was Dr. Diamond, one of the earliest and most successful amongst collotypists.

Some of the earliest steps in photo-engraving are due to Mr. Talbot. In 1853 he patented a process of photographic etching or engraving. In this process a steel plate which was coated with a film of mated gelatine, which was exposed under a cliché subsequently etching with a solution of bichloride of platinum. In working this process, which was suitable for subjects in black and white, Mr. Talbot endeavoured to secure gradation by the use of first employed what he termed beds, to give more grain or texture. The subject of photo-engraving continued to engage his attention, and he made further improvements, by which he succeeded in obtaining promising results, but not sufficiently perfect to give the process a commercial standing. About the same time Talbot gave much attention to perfecting an albumen process on porcelain tablets, which he patented. This was, under some conditions, very sensitive, and gave in the fraction of a second.

Mr. Fox Talbot has not recently maintained his interest in photography very actively. He never associated with photographic investigators, and never joined the Photographic Society. He was, however, an honorary member a few years ago, as a recognition of his claims in connection with the art. Of late years he devoted himself more to antiquarian researches,

consisting of the adjustable slit and the collimating lens; 3rd. The prisms; and, 4th. The camera with its lens.

The starting-point from which to commence procuring apparatus is undoubtedly the collimator, as on it depend the dimensions of the rest of the apparatus. It need scarcely be said that those who possess a spectroscope (not a direct vision one) will find the prisms of suitable dimensions for the collimator, but for those who desire to undertake the work without spending £50 or £60 on it, I recommend that the apparatus be purchased singly, and without being fitted up with micrometers, &c., in an expensive manner, since all this elaboration for photographic work is practically useless.

The collimator for good work should not be less than eighteen inches in length, and the collimating lens should be about $1\frac{1}{2}$ inches in diameter. The slit should be the most perfect of its kind, as on its accuracy depends in a great measure the quality of the resulting photographs. It should close perfectly through its whole length, and it is advisable that its jaws should approximate to knife-edges, since, if thicker, it is possible, and probable, that the image of the slit which gives the absorption (or bright) lines of the spectrum may at one time be formed by the inner part of the slit, and at another by the outer, a proceeding which is detrimental to sharp definition. The outer margin of the collimating lens should not be employed, and if the spot of light (when the light is thrown by the condenser on the slit) occupy a diameter of about one inch, that is the utmost that should be utilized. Diaphragms in the interior of the collimating tube should be arranged to effect this, and also to prevent light reflected from the sides of the tube reaching the lens. The section of a collimator is given in the

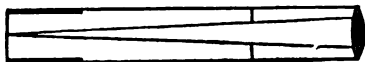
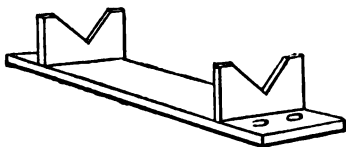


figure. The slit should be attached to an inner drawer tube, as shown.

In the ordinary spectroscope the collimator is attached to the iron or brass base which bears the prisms, and is, as a rule, only attached at the end near the lens by a socket and screw arrangement. Unless the workmanship be first-rate there is a danger of vibration by such an attachment. If the tube be supported in a cradle, however, the danger vanishes. For my collimator I have had made a wood cradle of the following shape. At one end are two screws



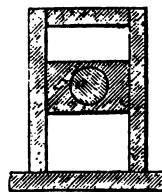
by which alteration in the height of the respective ends can be made, and a single screw at the other. By these three screws we have a perfect bearing on any surface, and a means of elevating the collimator bodily, or of altering it in inclination. The shape of the cradle itself also causes the tube to take a perfect bearing. The only thing wanting is to secure exact perpendicularity of the slit, and, practically, this is better done by hand than by any screw arrangement.

This cradle can be easily made by the merest tyro in carpentry, and answers its purpose as well as any much more expensive piece of apparatus. I may add that if greater firmness be required than that given by the weight of the collimator itself, it is easy to weight the base with lead, and to furnish the top of the Y's with a spring to clamp the tube into its place as in an ordinary theodolite. In regard to the lens of the collimator it is better that it should be achromatic, but this is not absolutely essential. For some time, and for a fixed purpose, I used a simple quartz lens. This caused a slight difficulty in focussing

parts of the spectrum, but not an insurmountable one. It will be found that in using an achromatic the difference in length of focus of the different rays is not exaggerated, as it is when an uncorrected lens is employed.

Having fixed on the collimator, the next piece of apparatus to be procured is a condenser. The image of the sun formed by it on the slit should entirely fill it, and it will be found that a pleasant dimension for the breadth of the spectrum is about three-quarters of an inch; in which case, supposing a six-foot camera be used, a convenient focal length for the condenser will be about three feet; that is, it will form an image of the sun about three-tenths of an inch in diameter. Supposing we fix on three feet as the focal length, and the available aperture of the collimating lens to be one inch, and its length eighteen inches, this at once fixes the maximum diameter of the condenser. It should just illuminate the one-inch, and no more. This would give it a diameter of two inches. If it be an achromatic lens, so much the better; but a common plano-convex or double convex lens will answer. And if the diameter be greater than two inches, a diaphragm must be used to get it down to that diameter.

The annexed figure shows a convenient mounting for



the condenser, being adjustable as to height, and by means of screws fixed in the base-board is made adjustable as to inclination of the axis of the lens to the vertical.

(To be continued.)

A TOUR IN THURINGIA.

BY H. BADEN PRITCHARD.*

ALTHOUGH Thuringia is not an extensive district, you cannot journey a dozen miles in one direction or the other without leaving one principality and entering another. A walk the first day, and a carriage drive the next, brought me through three different little dukedoms, while the territory upon which I now stand, called Schwarzburg-Rudolstadt, belongs, it appears, to somebody who is neither a duke nor a grand-duke, but only a prince. Of course he lives in a palace, but then all princes do that, and he goes out hunting every day of the week, for there is nothing else to do. He has an army, I know, because I met him just outside the courtyard.

"His Transparency does not permit any one to enter the courtyard," said the army to me, as I was walking towards the palace. He was a very nice little soldier indeed, and, as I did not want to get him into trouble, I at once complied with his request.

I thought, however, that his Transparency would not mind my taking a picture of his stronghold, so I set up my camera, and my friend the army stood bolt upright at one side. I should much have liked to have sent the little man a copy of it, for he was very attentive, and showed me the barracks of the state, a little four-roomed cottage covered with creepers. But, unfortunately, I find I did not turn my roller in taking the picture, so that when I come to develop I shall find a double image on the plate.

The prince himself, whom I had also the honour of meeting—you can't avoid him very well, for his territory is so small you are sure to see him whenever he is out-of-

doors—was very different to his smiling little soldier. He is tall, severe, and wears a fierce moustache. But then he has reason to be proud, for I hear that his income of florins, when translated into pounds sterling, amounts to nearly twelve thousand a year, so that he must be quite as well off as some of our lesser nobility or well-to-do city magnates.

Schwarzburg, notwithstanding its limited dimensions, is, nevertheless, a principedom to be proud of, for it is one of the most charming spots in Thuringia. The little village of Schwarzburg nestles cozily at the foot of the burg, or palace, which stands upon a leafy pedestal closing up the end of the valley. The scenery is like a bit of the Tyrol, and here and there is a stretch of green pasture land so smooth and even that it might be a soft carpet, trees that fringe the meadow on every side adding to the charm. The best view of the burg and its vassal village below is secured from a height called the 'Treppstein', where a summer-house has been built, with open windows so contrived as to appear like the framework of a picture.

Three ragged boys, my companion, and myself find ourselves up here; they have been blackberrying, and offer their wares to us in three little saucers. Blackberries are not, however, very rife in this part of the world, apparently, for twopence a piece is the price put upon the saucers. The boys go to school, they tell us, from six in the morning till half-past nine, and are then pretty well free to do anything they like. They address us as "highnesses," which causes my friend to ask them whether they have many princes like ourselves visiting Schwarzburg. In the end we buy their blackberries, but only on one condition: that they will sit down and behave themselves, and eat the berries as we look on, a condition they consent to amid a good deal of laughing and giggling.

We meet other visitors up here, and when I take my photograph, two young ladies are in the foreground as quiet as mice. I pack up my apparatus and walk off, but meeting the party some time afterwards they summon courage to speak on the subject of the photograph, of which they are naturally anxious to have a copy. But their spokesman falters before he has preferred the request, for he looks about for some signs of apparatus and camera, and seeing none, concludes he has made a mistake.

"I beg your pardon; I thought it was you who had been photographing."

"Yes," I replied.

"But I fear I have made a mistake."

"No; here is my apparatus, you see," and I pointed to my little leather case. "My pictures are only taken as reminiscences of my tour, or I should have been happy to have told you where to purchase them."

I hardly think my friends quite understood taking photographs for pleasure, for amateurs are not so frequently met with abroad as in England, where we have to thank them for much that has been done in the way of progress, and especially in connection with dry plates.

Across Kouigsee to Ilmenau is but a moderate day's walk, and I may give a hint here which some of my readers may like to have. There is nothing so refreshing as a cup of tea on a long walk, and I will mention how I obtained this beverage on the road-side with little trouble. There is to be purchased now-a-days a little flat kettle holding, perhaps, a pint, which weighs but a few ounces. A flat gauze spirit-lamp, containing sponge, so that it does not spill the liquid, is sold for ninepence, and this lamp has a stand attached whereon the kettle is poised. A four-ounce tin vial of spirit completes the outfit, which takes up but a small space in a tourist's sling bag. Inside the kettle are stored some tea and sugar, and with these appliances at hand a cup of tea can be made almost anywhere in ten minutes. The kettle is filled at a brook, and the lamp lighted down by the water where there is shelter from the wind; in five minutes the water boils, and in

goes the tea and out goes the lamp. Two tin cups which fit into one another are produced, and here we are drinking a cup of good English tea in the wilds of the Thuringian forest. And how nice the fragrant liquid is to a tired pedestrian I need not here set down.

Ilmenau is a forest town, well known as having been a favourite resort of Goethe, the great German poet. On the Kickelhahn hill, overlooking the little town, is a tower that offers a fine prospect over the country; and here, too, is the little house, restored since Goethe lived here, where he scribbled on the door-post with a pencil his famous ode to night:—

"Über allen Gipfeln
Ist Ruh',
In allen Wipfeln
Spürest du
Kaum einen Hauch.
Die Vögel schlafen im Walde;
Warte nur, balde
Ruhest du auch."

I take a picture of the Goethe cottage, standing on a shoulder of the Kickelhahn, and overlooking an expanse of foliage. From the Kickelhahn you can see right over to the Brocken of the Harz mountains, and secure a panorama of all Thuringia. Here there is a ruin on some lofty hill top, here the glistening towers or steeples of some little town or village. There is a story or legend connected with most of these old burghs, and a book, I hear, has recently been published of Thuringian legends which makes very pleasant reading. One of the best known of these is the story connected with the ruins of Kyffhaeusser, where the Emperor Frederick, old Barbarossa, called so from his long, tawny beard, is said to be still living down in one of the vaults of the ruined castle. They say that he sits upon a bench before a marble table, supporting his head upon his hand, dozing the time away, and every now and then he nods his head and rubs his eyes, as if about to wake up. His shaggy beard has grown right through the table, and now reaches to his feet. His courtiers stand silently around, and motionless, ready for the hour of awaking, and for the time when their old Emperor shall go back once more to rule the Fatherland. But this hour can only come, we are told, when the ravens that hover over the ruins fly away; or when Barbarossa's long beard shall have curled itself thrice round the table at which the old king sits.

RETOUCHING.

BY JAMES MARTIN.

SOME time ago, I urged some serious cautions on photographers, as to the excessive use of retouching: will you allow me to add a few remarks to what I then said, lest any of your readers might think that my strictures upon the practice of unlimited retouching then made were without due consideration. I will state the facts on which they are founded. A photographic portraitist works in a studio built expressly for his use, in which, if properly planned, he can command sufficient light from whatever direction may best suit his purposes. He has backgrounds, screens, and accessories, so that he is able to produce whatever effect he pleases. The pose of the sitter is also, or should be, entirely under his command. Therefore, if his skill be equal to the situation, he will be able to give the most agreeable representation possible of the subject. Further than this legitimate portraiture does not go. Any attempt made at idealism will result in loss of resemblance. The word ideal speaks for itself, as it signifies something which only exists in the imagination of the inventor, and is not the likeness of anything in existence. Should the idealised form be any way contrary to the laws of nature, it must necessarily represent a monster. Portraits are not treasured for the beauty or the fashionable attire of the originals, but they are intended to serve as lasting memorials of those

who are dear by the ties of kindred or affection, and from whom the changes of life or death have separated. A portrait album is not a thing to be exposed to the gaze of strangers, except it be filled with the representations of public characters; and here truth is *asine qui non*, as we are apt to look upon them with a philosophic eye, seeking to trace in their features some distinctive marks of the great qualities which we know them to possess. The expression of character is the very soul of portraiture, and any attempt at generalization destroys its chief attraction. With the landscape photographer, individuality is not paramount, therefore some poetical license may be allowed. In our variable climate, nature seldom shows herself in holiday guise, therefore it is perfectly legitimate—in fact, it is often necessary—for the photographer to be sufficiently an artist to be able to improve upon what he sees, always, of course, keeping the characteristics of the scene. Suppose, for instance, a view taken in dull weather, the introduction of a light cloud will give relief to the distant mountains on the horizon. A few touches of light will prevent the foliage of the trees appearing as huge silhouettes cut out of black paper. A diagonal graduated light thrown across a grass plot will prevent its looking like a dark wall. The representation of a few ripples or reflections will serve to distinguish a stream of running water from a pool of mud. The introduction of appropriate figures will enliven and complete the effect.

I have been only able to touch upon a few of the most prominent points suggestive of the direction in which the artist should work, neither am I able, in this article, to give any instructions concerning the method of working; but thus much I may say, that no double printing is necessary; on the contrary it will prove best to take some trouble to make the negative as perfect as possible, rather than have to resort to tedious, uncertain, and troublesome dodges to obtain each separate proof. I should be happy to offer a few practical suggestions for the guidance of beginners should you think it would benefit them.

Correspondence.

PHOTOGRAPHIC EXHIBITION.

SIR,—Will you allow me to call the attention of your readers to the fact that the last day for receiving pictures for the Photographic Exhibition is Tuesday, October 2nd. Intending exhibitors are particularly requested to comply with the published regulations, as any breach of them may lead to the non-acceptance of their pictures.—Faithfully yours,
H. BADEN PRITCHARD, Hon. Sec.

5, Pall Mall East, September 24th.

COLOURED LIGHT FOR WEAK EYES.

SIR,—Blue glass has long been used as the best medium for softening the light for weak eyes. Recent correspondents, however, favour yellow glass for this purpose. The objection against blue glass seems to be that it does not admit enough of light, and against yellow glass that it makes a glare. Both these objections might be obviated by a compromise, viz., green. This is the colour of the foliage and herbage which surround us on all sides; and it is a known fact that it is a rest for the eyes to look on a green lawn or on foliage from a brighter light, such as is reflected from the white paper of a book. For these reasons I think that green glass is preferable either to blue or to yellow.—I am, sir, your obedient servant,

A GREEN LIGHT.

GERMAN PHOTOGRAPHIC LITERATURE.

SIR,—On perusing the News of the 21st inst., I read, under the heading "Photographic Literature," that the "*Deutsche Photographen Zeitung*" will constitute the only

weekly photographic journal in Germany, unless the *Wochenblatt* is still in existence. I conclude from these words that you think our *Photographische Wochenblatt* has ceased to live, and therefore beg to inform you that the establishment of the *Deutsche Photographen Zeitung* will by no means affect our journal, as its existence is positively secured by a considerable capital, first rate contributors, and a great number both of subscribers and advertisers.

Trusting you will publish these few lines in your valuable journal, I am, sir, yours very truly,
EMER DUNN.

[We have much pleasure in receiving the assurance of the intended longevity of our energetic and excellent contemporary.—Ed.]

TRANSPARENCIES.

SIR,—I send a new process for making transparencies. The process is as follows.

Soak some gelatine in sufficient water for five hours, and then dissolve by heat. Pour double the quantity of methylated alcohol into it; let it stand for a few minutes until the gelatine falls to the bottom of the bottle, and pour off the water and alcohol. When perfectly drained, add the same quantity of water as first employed; let it soak a little while, and then dissolve the whole by heat; add some drops of glycerine. For use—

Solution of the gelatine	...	1 ounce
Bichromate	...	3 ounces or less
Water colour, or Indian ink	...	quant. suff.

Take a varnished negative, coat it with waxing solution; when dry pour a little of the bichromated gelatine on it, and spread with glass rod; let it dry, as it will in a few minutes. Place a piece of black velvet on it. After exposure, wash it with warm water as usual.

CARELESS OPERATOR.

PAINTING PORTRAITS IN OIL.

DEAR SIR,—With regard to the subject of painting portraits in oil, I would observe that I have noticed a practice which I consider amounts to a deception unworthy of art, viz., the use of paper enlargements pasted upon calico or canvas as a basis. From the nature of these materials they cannot be expected to resist injury, damp, and the effects of time, and, therefore, the purchaser's intention is frustrated, and the expense to which he has gone has brought little or no return. The various gradations of shade in the enlargement being obliterated by the opaque colour used in painting the picture, they become useless; therefore it would be much better to make an outline upon a properly prepared canvas, either by a photograph from the photographic enlargement, or, when of the same sizes, by superposition, which is easily done, without spoiling the enlargement, by rubbing over a sheet of thin paper of sufficient size with either common blacklead, lampblack, red chalk, or any powder colour. With the exception of blacklead, a small quantity of soap or grease should be mixed with them, which will make them adhere better to the paper, and not be likely to smear. Place a sheet of this paper (coloured side downwards) on the prepared canvas on which the portrait is to be painted; over this place the photographic enlargement face upwards; fasten the whole together firmly by drawing pins, or by any other means which will allow the two papers to be lifted in parts without displacing them, so that the operator may observe, from time to time, how the work progresses. Everything being nicely arranged, proceed with a moderate pressure to trace on the face of the enlargement its outlines, using a blunt style. On removing the papers, if carefully executed, a correct outline will be found on the canvas, and the photographic enlargement will prove of further service as a copy.

While on this subject I may notice a deception practised by unprincipled picture-dealers of foisting upon unwary purchasers oleographs got up to represent original

paintings, principally by the old masters. There is no doubt that this style of print is a vast improvement in pictorial art, affording, as it does, almost facsimiles of high class pictures, and when sold for what they really are, and at a moderate price, offers a boon to the public. But cases have come under my notice of a very serious imposition; it is not always that a magnifying glass will detect them, as the prints may have been worked upon for the express purpose of deception. The best way is to remove the picture from its frame, when it will appear as if it had been re-lined; remove a little of the paper generally pasted round the margin; then remove a bit of the picture itself from the canvas at a corner; the material on which the picture is painted (should it prove to be paper) will at once disclose the deception.—I am, dear sir, yours truly, JAMES MARTIN.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN out-door meeting of this Society was held on Thursday, the 20th instant, the scene of operations being Largo, one of the numerous quaint fishing villages on the East coast of Fife famous for its connection with the popular song "The Boatie Rows," as well as being the birthplace of the celebrated author of the ever fresh romance of "Robinson Crusoe." It stands at the head of the bay, and affords, both in the harbour with its fishing-boats and in its straggling and often picturesque houses, some capital work for the camera, while within easy distances are several ruined towers, or castles, and an interesting Roman monument well worthy of being visited.

In consequence, not so much of its distance from Edinburgh, as of the out-of-the-way corner in which it lies, the necessity for crossing the Firth of Forth, and the limited train service, an early start was necessary, and so the party left the Waverley Station at 6:25, and reached Largo at 8:30, quite ready for a good breakfast, although, as it turned out, it was not so ready for them. As the worthy treasurer was the only member who had not brought his camera, he was despatched to commissariat duties, while the rest went on exploring expeditions, and, as the morning was fine, the light all that could be desired, and hardly a trace of wind, all were sanguine of a successful day.

"But ah! how little mortals know
When chance may prove their friend or foe."

Largo contains two inns, the "Railway," and the "Crusoe," and the commissary, believing that it is true of hotels as of men, that a good deal can be learned from external appearances, resolved to reconnoitre a little, before deciding as to which he should patronize. There was, however, not much to choose between them, except, perhaps, the windows of the one were cleaner than those of the other, and having a leaning to the ancient rather than the modern, he applied to the "Crusoe," but applied in vain. Like its prototype, it would have gladly taken in one, but on no consideration would it undertake to breakfast the party. Well, of course, there was no help but to try the "Railway"—surely he would succeed there! Its very name implied progress, and hinted at preparation for travellers; but, alas! his application there seemed at first doomed to share the fate of that made to the "Crusoe." The good wife of the "Railway" thought she could manage one, or perhaps two, but there really was nothing in the house to breakfast as many as he wanted to cater for. Fish, the commissary suggested—surely Largo Bay had still plenty of fish! But no; the fishermen had either not cast their nets, or, if they had, they had not caught even the classic "nine," as there were only three available: and what could they be amongst so many? However, after considerable persuasion, the landlady agreed to do the best she could, stipulating that they must be satisfied with the three fishes and as many eggs as they could eat; and as "hunger is good kitchen," they enjoyed the breakfast thoroughly. By the time it was finished the clouds had gathered in, obscuring the sun and casting a gloom over the hitherto cheerful prospects for the day, the sky having assumed that dull leaden appearance which usually betokens a continuation of the same. They proceeded to the harbour, however, and several plates were exposed there by the younger members; but the older and more experienced—and, perhaps, too, less enthusiastic—decided to give it up as a bad job, and

return to Edinburgh by the first train, considering the flat, uninteresting pictures that could only be got in such a light not worth the trouble of taking. But by the time Burntisland was reached an unexpected change had taken place, and the sun had again put in an appearance. Here they remained and exposed a number of plates, some on the shipping in the docks, and some on the not unpicturesque street.

By five o'clock the plates were exhausted, and the party adjourned for refreshments, after which Mr. Pringle took the chair, and some routine business was transacted, and Mr. Lawson admitted an ordinary member.

The plates included the ordinary collodio-bromide and gelatine as modified by Mr. Gray, and the exposures varied from ten seconds to thirty minutes, the former proving quite long enough for the gelatine.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE first meeting after the summer recess was held at the Memorial Hall, on Thursday evening, the 18th inst., the President, Mr. ALFRED BROTHWELL, F.R.A.S., in the chair.

In the absence of the books through misadventure, the confirmation of the minutes was postponed until the next meeting.

Mr. COORS exhibited a number of fine collodio-albumen negatives taken during his summer trip to Connemara.

Mr. M. NORON showed and described a new method of arranging the camera front [in our next].

Mr. LUND exhibited a collodio-albumen plate, prepared by Mr. Pollitt in 1869. This plate was exposed by Mr. Lund about September last year, and developed on the 12th instant. The result was a good, clean negative.

As is usual, the first meeting of the season was poorly attended, and the members present busied themselves with the Society's portfolio.

After a vote of thanks had been accorded to Messrs. Coats, Norton, and Lund, the meeting was adjourned.

Talk in the Studio.

CATALOGUE.—We have received a copy of the catalogue of chemical appliances manufactured and sold by G. Mason and Co., of Glasgow. For all engaged in chemical operations this catalogue will be invaluable. It is singularly complete, admirably arranged, and well illustrated. It is not needed by the photographer for his ordinary working appliances; but to all engaged in chemical and experimental work we strongly recommend an examination of this catalogue.

SHERIFFS FOR LONDON.—The inauguration of Mr. Alderman Nottage and Mr. Alderman Staples as sheriffs for London and Middlesex will take place to-day at the Guildhall. The procession will leave the Albion at half-past twelve, and pass through Aldersgate Street, Barbican, Redcross Street, Finsbury Street, Aldermanbury, Gresham Street, into Guildhall Yard, returning to the Albion by way of King Street, Chesapeake, and Aldersgate Street.

MR. BRIGHT ON PHOTOGRAPHY.—In a recent speech on Progress in Science and Art, Mr. Bright said:—"If you come to the science or the art, whichever you may call it, of photography, that is entirely new. Many of us who have lived a good while in the world have no portraits of our parents—our parents passed away to the future life before this great invention was made; but now in every family parents can have portraits of their absent children; children can have portraits of their absent parents; we can have portraits, as no doubt most of us now have, of those who have loved us, and whose features we shall see no more here; and all this is brought into every home at the smallest charge, not to the rich alone, but to the poor everywhere, for science is not a respecter of persons, but is good to everybody to whom it comes near, and with whom it deals."

WRACK OF THE "FORSTER."—Two photographic pictures in a cigar-box have been picked up off Whitesea Coastguard Station. The pictures were on glass, and in an old style of art. One of these consisted of the likenesses of three young men, who appear to resemble colonists from the style of their dress and other surroundings. The other picture was the portrait of a young woman.

A NATIONAL COLLECTION OF PHOTOGRAPHS.—"One of the Many" writes to us (*Daily News*):—"May I ask the help of your valuable paper in proposing that the National Gallery authorities be persuaded to make and exhibit for public benefit a national collection of photographs that should show by means of permanent fair-sized photographs, taken from the objects themselves—as complete a collection as possible of the time-honoured treasures of painting, sculpture, and architecture—the relics of the best times of art that those who travel go abroad to see. Thus, the collection should comprehend photographs of each of the famous buildings and valued ruins; those of a kind hung together, and grouped according to their style, with photographs again of rich details enlarged. It should show the famous pictures, each artist's works being hung together, and grouped by their subjects. The antique statues and bas-reliefs; those of the same personages together and grouped by their attitudes. And Michael Angelo's statuary. Lastly, the whole number of photographs should be repeated on a small scale, grouping them according to the towns to which each object belongs. Such a school as this collection would be ought to improve gradually the art of the country, when architects and they who employ them—painters and sculptors, and they who judge their work—have the power of seeing and growing familiar with the best samples of the sublime and beautiful in art that the world boasts. Plenty of the objects have already been photographed, and only need collecting; numbers would have to be taken expressly, but the expense would be small in comparison with the advantage, which would be very great. The collection might well find a place on the walls of the ground floor under the National Gallery."

To Correspondents.

L. D. L.—Is the patent lens in question the back lens can be separated by unscrewing, so as to produce diffusion of focus. Where you do not require that kind of definition you can keep it screwed tight up. The maker of any apparatus will, as a rule, furnish you with the fullest and most satisfactory information as to its objects and mode of using.

CARELESS OPERATOR.—We know nothing of the matt paper to which you refer, and the portion of advertisement you enclose affords us no clue, as it mentions no advertiser's name. Write to the advertiser (whose address you have doubtless retained), and ask him for information. 2. Unless you are familiar with, or master of, some dry plate process, you had better use the wet process for enlargements.

JOHN SALT.—All the tools mentioned in the article to which you refer can doubtless be obtained at a hardware shop, or of a dealer in tools. Many workmen make a mitring block themselves; it is not a difficult task. We cannot give you any information about the prices of tools.

NEGATIVE.—There are many manuals of photography for beginners. There is, however, none better than Captain Abney's *Instruction Book*, sold by our Publishers.

T. R. R. sends us a negative packed between two pieces of mill-board, for transmission through the post, and remarks that he packs it thus carefully to try the experiment, and wishes to know in how many pieces it arrives. We hope the experiment is satisfactory to him, for it came in more fragments than we have time to count, and each of too small a size to afford us the slightest clue to the character of the negative, upon the defects of which we were requested to advise. The primary intention of sending the negative is therefore sacrificed to an experiment which should not require making. It is quite impossible that a glass negative can pass safely through the post, subject to the stamping operation and other risks of transit, without properly packing in a box. If, by rare chance, this negative had come without fracture, it could have been no proof that another would do the same. We must warn our readers that on receiving a post packet containing broken glass we generally throw it away at once, as opening it on a writing desk covers everything with minute fragments, dust, and specula or broken glass, at once dangerous and uncomfortable. As you do not describe the defects of the negative, we have no data upon which to offer advice. 2. The spots of the sensitive paper are clearly due to dust of some kind; iron rust would produce such an effect, as almost any reducing agent would. It is not hypo, certainly.

M. D.—We do not know of any systematic application of photography to the delineation of morbid anatomy. It has frequently been employed for preserving records of special cases, but not systematically applied, so far as we know. The late Dr. H. G. Wright took great interest in the subject, and made a collection of all the photographs of medical subjects he could obtain. Dr. Diamond applied photography to the portraits of the insane, and made a valuable and interesting collection.

F. A. G.—Fargier did expose the sensitive film of gelatine and pigment on one side and develop on the other, but in an awkward and inconvenient fashion. He coated a plate of glass with the brominated gelatine, and exposed under a negative whilst on the glass; then coated the film with plain collodion, and plunged the plate in warm water to develop. The collodion film with the image attached eventually floated off the plate, and was removed from the water and mounted. It is clear that this method was only available for very small pictures. The Abbe Laborde and M. Poitevin in France, and Mr. Blair in this country, had previously pointed out the principle of exposing on one side and developing on the other as the true solution of obtaining half-tones in carbon, but had not devised efficient means of effecting this object. It was Mr. Swan who originated an efficient means of doing this.

CORRECTION.—We have received a letter from the editor of a contemporary stating that the article on glass which appeared in our last, accredited to the *Scientific American*, originally appeared in the *British Journal*, and should have been accredited to that journal. We can simply explain that the cutting was sent to us by a friend who had clipped it from another journal where it was accredited to the *Scientific American*, and we reproduced it as it was printed. We give our contemporary's claim as he makes it without question or doubt, and we consider we paid him a high compliment in considering that the article was good enough to reproduce in our pages.

J. W. G.—For a beginner having had no tuition and little experience your work is promising. The printing and toning are good. The most prevalent fault is a lack of definition, either from imperfect focussing, or movement in the sitter. You will improve by observation and care in the pose, arrangement, and general artistic qualities of the work.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR AUGUST.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.

Observations taken at Brayton, near Whitehaven, 36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1	29.75	29.78	29.75	59°	61°	55°	Fair, generally cloudy.
2	29.79	29.80	29.81	59	60	56	Fair, generally cloudy.
3	29.79	29.80	29.82	58.5	—	53	Fair, generally cloudy.
4	29.84	28.85	29.90	60	62	58	Fair, generally cloudy.
5	29.90	29.9	29.83	61	72	64.5	Fair and sunny.
6	29.74	29.70	29.61	62	72	60.5	Rain p.m.
7	29.40	—	28.25	68.5	69	61	Rain a.m. and p.m. [ning afternoon]
8	29.19	29.14	29.20	63	70	62.5	Rain a.m. and p.m. Thunder & light-
9	29.32	—	29.30	62	63	60.5	A little rain this morning and evening
10	29.46	29.53	29.75	60	64	57.5	Rain showers about five p.m.
11	29.81	29.82	29.82	62	62	55	Fair, generally cloudy.
12	29.95	—	29.99	63	66.5	59	Fair and sunny.
13	29.8	29.80	29.67	64	74	62	Fair and sunny.
14	29.75	29.75	29.75	68	77	62.5	Fair and sunny.
15	29.72	29.73	29.78	68	68	60	A little rain this afternoon.
16	29.70	29.64	29.70	68	70	63.5	Rain this evening. Lightning at night
17	29.75	29.80	29.8	66.5	66	64	Fair, generally sunny.
18	29.66	29.76	29.73	63	66.5	62	Rain a.m. and p.m.
19	29.58	29.54	29.50	62	67	61	Rain a.m. and at night
20	29.48	29.43	29.39	63	67	64	Rain a.m. and p.m.
21	—	—	29.43	60	—	58.5	Rain a.m. and a little p.m.
22	29.43	29.48	29.48	54	56	60	Rain a.m. and p.m.
23	29.79	29.65	29.61	63.5	60	57.5	Showers about noon.
24	—	29.94	29.94	58	—	53	Fair, generally sunny. Thunder and lightning early this morning
25	29.87	29.89	29.43	61	63	59	Rain this evening
26	29.81	29.60	29.71	57.5	60	53	Fair, generally sunny
27	29.55	29.61	29.60	58	64	62	Rain p.m.
28	29.58	29.50	29.58	62.5	68	57.5	Rain a.m. Windy
29	29.61	29.68	29.57	63	61	54	Fair and sunny.
30	29.40	29.48	29.68	54	61	61	Rain a.m. and p.m. Lightning at night
31	29.50	29.67	29.60	53	58	52.5	Showers a.m. and p.m.

Summary.				Mornings. Noons. Night.		
Highest temperature observed	...	...	...	68.5°	77°	64.5°
Lowest ditto	...	...	...	53	56	47.5
Mean ditto	...	...	...	61	63.5	58.5

Mean of all observations 61° 5
 Number of fair days 13
 Number of days on which rain fell 13
 Number of fair days sunny 7
 Number of fair days gloomy 6

NOTE.—I see nothing particularly worthy of comment in the observations of last month (August), but it may perhaps be interesting here to note the exceptional height of the barometer yesterday and to-day, as follows—

	Morning	Noon	Night
September 30	29.13	29.20	29.16
" 1	29.20	29.28	29.23
" 2	29.23	—	—

After the particularly wet weather during the whole of this year, may we hope this to be the commencement of a fine autumn!

September 18th.

The Photographic News, October 5, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

HOW SCIENTIFIC EDUCATION IS CONDUCTED IN AMERICA—

DR. STEIN'S LAST SCIENTIFIC APPLICATION OF PHOTOGRAPHY—SOLUTION OF SILK ONCE MORE—A SIMPLE TEST FOR THE HALOID SALTS OF SILVER.

How Scientific Education is Conducted in America.—Our American cousins have conceived a bold idea for educational purposes; it is no less than a scientific and educational expedition round the world. And if this, the first experiment, is successful, we may hope to see such a tour form one of the ordinary items of education with New England youths. America is used to "big things," and our cousins think nothing of an excursion which takes the best part of a year to execute. As to journeying across the Continent to Frisco and back, why, that is merely a matter of days; and if a train on its way over the prairie gets pillaged by a party of marauders, as was the case only the other day at Big Springs station, why that only adds to the excitement of the journey and to the experience and education of the traveller. In the end, too, we suppose, accident and loss of life from railway travelling is less in the United States and Canada than with us, although, it is true, in this, as in everything else, "big things" are not unfrequently met with. The scientific and educational expedition to which we refer seems to have been projected by a Mr. Woodruff, of Indiana, and the extent of the scheme may be imagined by the circumstance that accommodation is arranged for four hundred students. A steamer, the *Ontario*, has been fitted up with berths to accommodate this number, and large cabins for study are to be improvised. Science, both natural and experimental, is to form the main instruction on board, and six professors are part of the staff. A photographer will also accompany the expedition professionally, who will be provided with every requisite for carrying on his duties efficiently; but many of the students who come on board will be, doubtless, amateur photographers themselves, or develop into such before they get far on their voyage. Besides the six professors and photographer, the staff is to consist of a chaplain, a chief engineer, two surgeons, and five naval officers. The experience of the last will be very necessary, for the *Ontario* is to visit many out-of-the-way ports and islands of the globe, the students making excursions inland at most points of interest. Here studies will be made of the animal and vegetable kingdom, and geological and chemical instruction imparted, while, as a matter of course, the camera is to be busily employed in securing pictures of objects of scientific and general interest. A more instructive voyage can scarcely be conceived, but it is one in which young men, rather than youths, should participate—those, namely, who can realise to the utmost the advantages they enjoy. It is, probably, the voyage of the *Challenger* which suggested to Mr. Woodruff this grand scheme, for not less than two years will be passed in this expedition round the world—ample time, we should think, to visit all quarters of the globe. The expedition starts from New York, we are informed, on the 25th of this month, so that those in this country who are contemplating the voyage must lose no time in making up their minds. A charge of five hundred dollars represents the price of a ticket, which gives students their cabin and food, and includes all fees to professors, &c.; a large sum, it is true, but scarcely an exorbitant one, taking all circumstances into consideration.

Dr. Stein's Last Scientific Application of Photography.—Dr. Stein, of Frankfurt, whose name is familiar to our readers as one who has done much to apply photography to scientific purposes, has now succeeded in constructing an apparatus for recording minimum periods, or, in other words, acting like a time-piece to register lapses of times of the briefest character. Dr. Stein has already constructed an

instrument, and another, not less ingenious, for photographing sound, or, rather, the vibrations upon which sounds depend. The minute waves written down upon the sensitive plate are, in both these cases, so fine and delicate as to bear magnifying to a high degree, and hence we are made acquainted with phenomena which take place in the fractional part of a second. In the present case, apparently, Dr. Stein has no difficulty in registering thousandths of a second, the time that the light is shining upon his plate being shown by an index that can be read by anyone. Electricity, as may be guessed, is employed for opening and shutting the lens, and this movement, we are told, takes place within thirty-five-thousandths of a second. His instrument is to be employed for measuring the speed of various bodies, and for delicate mathematical work. A similar apparatus, only not photographic, has been in use by physicians for some time, to determine the velocity of nerve sensations, when thousandths parts of a second also form the unit; and it is, doubtless, in connection with such an apparatus that Dr. Stein has employed photography. Again, in estimating the time which elapsed in a cannon ball rushing through the bore of a gun, an arrangement of the same kind has also been in use. In this case the readings are made with the eye at the close of the experiment, but Dr. Stein's apparatus would, no doubt, record the result photographically. The last application is but another indication of the assistance which photography lends to scientific research.

Solution of Silk once more.—Substitutes for collodion are not easily found, and, indeed, the only two bodies that have been employed with any success as a vehicle for sensitive salts are our old friends albumen and gelatine. At one time, however, another body was brought forward, and, for a while, bade fair to be applicable by photographers: we mean solution of silk. Persoz employed chloride of zinc for dissolving silk, and after him came Spiller, who found that the material dissolved readily in hydrochloric acid. Another chemist (Schlossberger) employed nickel-ammonium oxide to dissolve the silk, and now a fourth method is suggested by Lowe, who uses an alkaline glycerine-copper solution for the purpose. We may, therefore, expect that renewed efforts will be made to make some use of silk in solution as a substitute for collodion. Both Persoz and Spiller endeavoured to secure results with sensitive salts, but their experiments do not appear to have been attended with much success. So far as our experience of silk solution goes, the film deposited on drying is deliquescent, and hence it is ill-adapted for printing purposes. But we cannot help thinking that research in this direction would be well worth taking up by chemists.

A Simple Test for the Haloid Salts of Silver.—A German chemist, Herr V. Goldschmidt, cites a very simple method of examining the chloride, bromide, and iodide of silver with the aid of the blowpipe. These three compounds are in many respects so similar that the trustworthy test furnished by Herr Goldschmidt will be gratefully received, and especially by photographic chemists. The ordinary test conducted by fusing the chloride and bromide with bisulphate of potassium does not give accurate results, whereas that proposed by the author is at once to be relied upon, and very simple in its nature. He scoops a cavity in a flat surface of charcoal, and places therein the silver compound to be examined with some powdered sulphide of bismuth. This sulphide of bismuth, by the way, is easily prepared by fusing bismuth with flowers of sulphur. A blow-pipe flame is then applied. If a bright red incrustation is the result of this heating together of the silver compound and sulphide of bismuth, the former is proved to have been iodide of silver; if a deep yellow incrustation results, the silver compound was bromide; if the incrustation is white, it is a proof that chloride of silver was present. These incrustations are said to be very volatile, and are formed at some distance from the cavity of the charcoal. Photographers have, therefore, a ready means

of ascertaining the nature of a silver compound, and distinguishing one from the other, the only apparatus necessary for the purpose being an ordinary blow-pipe and a bit of charcoal.

EXPERIENCES OF LICHTDRUCK PRINTING.

BY JOSEPH LEMLING.*

THE glass plates necessary to Lichtdruck work are now to be purchased in commerce, so that the photographer or Lichtdrucker is no longer required to follow the laborious operations involved in polishing one plate against another to render them smooth and level. Plates which have already been employed in Lichtdruck I allow to remain four-and-twenty hours in an alkaline lye of wood-ash or soda, and then scrape with a knife until the softened film has been removed; a final rubbing of the surface with powdered pumice removes from the pores of the glass the last traces of the preparation that has been applied.

For Lichtdruck purposes may be employed also, with success and simplicity, copper plates (not brass) specially prepared for such use. The plates are very thin, and are fastened to an even basis of some thickness; the sensitive film in this case consists of gelatine, water, and chrome salts, without any other addition. The film applied to the matt-ground copper plate attaches itself very firmly, and the printing is very convenient. The progress of the printing in the frame may be watched by the aid of strips of silver or bichromate paper. As formula for the sensitive film, I recommend:—

Chrome salts ...	...	...	...	1 part
Gelatine ...	...	...	...	5 to 7 parts
Water...	...	...	...	50 to 70 „

Of the drying of the sensitive film—the most important part of the work, because success depends so much on it—I will speak at a later period, as also on the subject of the influence of more or less chrome salts.

The printing-film requires a preliminary film in order to hold it fast to the glass plate. In this case a thin film consisting of white of egg, gelatine, and water, or only of white of egg and water, and so much chrome salts that it does not crystallize out on drying between 20° and 25° Reaumur, may be employed. A mixture to be recommended is:—

Water ...	...	...	...	480 parts
Gelatine ...	...	...	...	22 „
White of egg ...	...	...	...	240 „
Chrome salts ...	...	...	...	12 „

This mixture has the advantage of drying in an ordinary warm room, and there is not sufficient bichromate to crystallize out. Plates coated in this manner may be preserved, supposing they are kept dry and screened from the light, for a week or a fortnight. The film or matt surface of the glass plate is placed upon a black cloth, and then exposed to diffused light from the back. With a little practice it is easy to judge the time of exposure by the tint of the film.

The under-film must possess two properties, it should be remembered: firstly, it should be capable of adhering firmly to the glass plate; and secondly, it should hold fast to the second film. The first property is wanting when the exposure has been too short, the second if the exposure has been too long. Another film which I can strongly recommend as a preliminary coating is that resulting from:

Water ...	...	...	...	45 parts
White of egg ...	...	...	...	35 „
Saturated bichromated solution ...	...	...	...	15 „

The drying of this film must not, however, take place under a temperature of from 20° to 25° Reaumur.

* Photographische Correspondenz.

Diluted soluble silicate will also give a very good preliminary coating without any white of egg or bichromate at all, but in this case a moist atmosphere must be studiously avoided, so that the film may not suffer.

It is in Lichtdruck as in all other branches of photography: one operator works with this formula, another with that, and prefers one to the other according as he gets the best result and grows used to it. Some people tell us such and such an addition to the gelatine is necessary, others again that it is positively injurious. The most useful addition—although it may not be necessary for all sorts of gelatine—is white of egg, and this only in small quantities.

The mixture employed for the upper film may be the simple one to which I have referred, or another of a more complicated character. The production of the film and the drying of the same require practice and experience. The gelatine, though it may always be drawn from the same sources, varies very much in character. For this reason it is obvious that a process in which merely water, gelatine, and bichromate are employed, cannot be always governed by the same principles, and modifications must from time to time be adopted, according to the properties of the mixture. I may mention, however, the result of some of my experiences. Very concentrated gelatine solutions yield a rough printing grain. For some gelatin films—as, for instance, those which set easily at 15° R.—the proportion of the material to be employed should be one part gelatine to eight or ten parts of water; other gelatines will only yield a fine printing grain with twelve or sixteen parts of water.

The same result is not to be obtained with other descriptions of gelatine, even with great care, unless white of egg is added. Even when a thin gelatine solution produces a thick film, which contains enough chrome salts, and dries at a high temperature, the salts become decomposed and the gelatine changes in such a fashion that the resulting grain is as coarse as that of a rough lithographic stone. Under such circumstances the production of fine prints is of course, simply impossible. Thin films, which dry too rapidly, betray, after washing, scarcely any relief at all whether much or little bichromate is contained therein. Such films are also unsuitable for collotype printing.

A high temperature for drying, as is frequently recommended, is highly detrimental. In such matters much depends, of course, upon the nature of the gelatine and the salts it contains, and also upon the temperature at which it was in the first instance produced. The chrome salt, according to its nature, whether it is ammonia or potash exercises also considerable influence. The more concentrated the chrome salt, the rougher will be the resulting film. Too little bichromate, on the other hand, will give rise to flat impressions.

The employment of too much white of egg, again, is fraught with disadvantages. I have had to do with gelatines which, if not mixed with other descriptions, were quite unable to produce Lichtdrucks in any way, for they never yielded pure prints. Certain sorts of gelatine, which are peculiarly suited for Lichtdruck purposes, and are recommended by makers, and command high prices, have in my experience, frequently turned out less favourable than that obtained from the ordinary druggist. There is gelatine to be had which only gives good and delicate impressions when the film is dried without any admixture of bichromate, the latter being applied afterwards in the form of a cold saturated solution, to which a little sugar has been added. This addition I have recommended for years past, the film being afterwards dried at a mild temperature. The mixture of bichromate and sugar should only be permitted to act upon the gelatine for a brief period—say thirty seconds. It is in this way that I prepare photo-lithographic paper: I take stout, fine paper, and having applied the mixture and exposed, put it for a short time in cold water; it is laid wet upon a glass plate, and

then inked up with a litho roller. In this way I get a much finer transfer than is usually the case.

As regards the ink to be employed in Lichtdruck, it must, firstly, not be crumbly; secondly, not too tough; thirdly, not so firm that it will not spread in fine layers; and, lastly, it must not be too soft or smeary. A colour which is too tough and firm, rubbed with a little linseed varnish or linseed oil, yields a very suitable ink.

In choosing colours of various tints, all those must be excluded which act as a mordant, or have a tanning effect upon the gelatine film; also all such colours which bleach or darken by light should be rigidly excluded. There are quite sufficient of fleeting photographs in the world, without our adding Lichtdrucks to the number.

The purpose of the Lichtdruck process is not only the production in a rapid and ready manner of photographs, but to obtain them of a permanent character; it is only by the execution of solid work that we can retain the confidence of the public.

In conclusion, I will here set down the answers to some questions which are frequently asked by those who are interested in the production of permanent photographs:—

1. Have carbon prints any real future, considered from a business point of view? My answer is: Certainly, in the case of a certain number of copies from one negative being required.

2. Is it a wise and paying speculation for a photographer or lithographer to introduce Lichtdruck or any similar branch of photography into his business? I reply: Without doubt, if he has means at his disposal, and has opportunity to learn.

3. In what direction is Lichtdruck to be employed in a profitable manner? I answer: In every direction and on every occasion that a large number of copies of any one cliché are required.

THE LATE W. H. FOX TALBOT.

(From the ATHENÆUM).

MR. WILLIAM HENRY FOX TALBOT, F.R.S., died at Lacock Abbey, on the 17th inst., at the advanced age of seventy-eight. Mr. Fox Talbot's name is intimately associated with the processes by which pictures are obtained by the influence of the sun's rays. Long before the announcement that Daguerre, in 1839, has discovered the process which bears his name, Mr. Talbot, in the quiet of his ancestral home, had been at work quietly following out the indications which Wedgwood had left behind him. No sooner had it been whispered that Daguerre could obtain pictures by solar influence, than Mr. Fox Talbot exhibited to his friends pictures which he had taken, and he published in the *Philosophical Magazine* an account of his "photogenic" process. Those, the first photographs on paper, were but imperfectly fixed, and they soon faded, or became greatly impaired in beauty. Sir John Herschel commenced his photographic researches, and to him belongs the merit of having introduced an agent (the hyposulphite of soda) by which those photogenic drawings could be rendered permanent. A letter describing Daguerre's researches will be found in the *Athenæum* for January 26th, 1839 (No. 587). Mr. Fox Talbot's paper read before the Royal Society was noticed in the *Athenæum* of the following week, and printed for the first time in the number for February the 9th of that year.

Mr. Fox Talbot zealously pursued his experiments, and he was within a comparatively short time rewarded by the discovery of a process (in 1840), the Calotype, which well deserved the name he gave it. This highly sensitive photographic process owed its sensibility to the discovery that a latent image, produced by the shortest possible exposure to the sun's rays, could be rendered visible by the action of gallic or pyrogallie acid.

The discovery of this process, which was sufficiently sensitive to secure delicate portraits, started many chemists and others on the path of photographic enquiry. The result of this was that the collodion process was discovered by Mr. Scott Archer, and this, at one step, removed photography, by its exquisite sensibility, and its extreme facility, from the closed circle of scientific inquiry, and placed it in the hands of the public. Mr. Fox Talbot had—as we think, most unfortunately, and very unwisely, patented his photographic process, and this led, after the development of the collodion process, to an action at law, for the purpose of determining if the development of a dormant image on paper—no

matter by what agent—could be secured to the patentee. The decision was against Mr. Fox Talbot's claim, and this led him to abandon a field of inquiry with which his name must be forever associated.

Mr. Fox Talbot's scientific researches were not confined to the chemical agency of the sun's rays; he was an earnest inquirer into electrical phenomena, and made numerous experiments to determine if it were possible to apply electricity, or magnetism, as a motive force. None of these led to any practical result, but many of the machines constructed showed great mechanical ingenuity, and exhibited considerable philosophical investigation, as well as many most striking experimental results.

In compliance with an invitation from Messrs. Sampson Low and Co., Mr. Talbot was latterly engaged in writing an account of his early researches and discoveries in photography, to form an appendix to the second English edition of Tissandier's "*History and Handbook of Photography*," to be published shortly. This account, which will be illustrated by two specimens of heliographic copper-plate prints, made by Mr. Talbot, will doubtless be much valued by all interested in the beautiful art towards the perfecting of which Mr. Talbot did so much, and with which his name will be ever connected.

[From the STANDARD.]

SOME eight-and-thirty years ago there used to be visible in the corner of an optician's shop window in Regent Street a pale and dingy vignette, on which, probably, few passers-by ever cared to bestow a glance, unless it were those inveterate *flâneurs* to whom the contents of shop windows, be they ever so humble, are a source of perennial delight. The little picture somewhat puzzled the inquisitive, since, with all their lengthened experience, they were fain to confess that they had never seen anything of the same kind before anywhere else. It was on a thin, yellowish paper, and its hue was a monochrome of an uncertain bistre; but whether the thing itself was a mezzotint engraving, or a lithograph, or an Indian ink drawing, none but the initiated—and the *flâneurs* were not then initiated—could tell. It represented only a few shelves full of variously bound books; but the marvel about it was that every particular volume, from bulky folios to ragged-backed paper pamphlets, was delineated with an accuracy of draughtsmanship and a microscopic fidelity in texture and detail which might have aroused the envy of a Gerard Douw or a Wilkie. No modern præ-Rafaelites ever produced such exquisite "finish" as was visible in the contents of those miniature shelves; and, abating the depressing sepia tint pervading the whole, the books looked alive—as much as objects of still life could look, indeed. What human hand had executed this curious performance? The artist came to be known afterwards well-nigh simultaneously in England and in France. His name was Sol, otherwise Phœbus, sometimes called Apollo, and thousands of years since a blind poet dubbed him the "Lord of the Silver Bow." He was, in short, the Sun, whose magic pencil had been pressed into the service of an ingenious mortal—a modest English gentleman named Fox Talbot, who died a few days since at the good old age of seven-seventy—and the shallow little vignette in the optician's window was one of the earliest known specimens of that which was subsequently called the Talbotype. It was the infant Hercules. It was photography in its cradle. The tiny thing has faded away, perchance, these many years past, or has been relegated to the limbo of waste paper; but if it be yet in existence it should be prized by its possessor as charily as though it were Stephenson's "Rocket," or Tycho Brahe's telescope.

When another Beckmann compiles a fresh "*History of Inventions*," he will be false to his trust if he fails to record that a more open-hearted, simple-minded, or self-denying philosopher than the late Mr. Fox Talbot has rarely existed. He never claimed to be the original inventor of heliography. He knew perfectly well that Wedgwood had made public the results of some partially successful experiments in producing pictorial images on glass, rendered sensitive to the action of light, and he may have heard that among the occult processes essayed at the wonderful laboratory in Soho by Matthew Boulton, the illustrious partner of James Watt, was one for copying paintings and natural objects by means of the sun's rays focused through a lens on to a sensitive surface. Of Lord Brougham's claim to have invented photography, Mr. Fox Talbot was probably ignorant, for the assertion was only publicly made in Brougham's posthumous published autobiography; but the discoverer of the Talbotype was aware that Sir Humphrey Davy had revealed early in the century his observations on Wedgwood's experiments, and that in 1827 the distinguished Frenchman, Niepce, had made known in

London his experiments in a similar direction. Six years afterwards Mr. Fox Talbot, happening to be sketching the scenery of the Lake of Como, and availing himself of that fascinating but delusive toy, the camera-lucida, as a mechanical assistant, fell to thinking whether it might not be possible to render permanent the fleeting images cast on the pages of his sketchbook by the camera. He thought and thought and experimentalized incessantly, when, just as he deemed that he had brought his cogitation to a successful issue, read in a foreign scientific journal that a certain Frenchman, named Daguerre, had arrived at a discovery analogous to his own. The pictures of the Daguerreotype were, it is well-known, produced on thin silvered metal plates. Mr. Fox Talbot's medium was paper, and in 1839 he communicated his invention to the Royal Society, of which he was a member. Consistently modest, he desired to term the process "photogenic drawing," or "calotype"; but the large-hearted Sir David Brewster insisted that it should be called the "Talbotype." Subsequently, all the processes were merged in the wider appellation of photography. At least in this case neither the distinguished Frenchman nor the illustrious Englishman was insidiously robbed of his glory. A compromise was effected, and Light, the parent of the entire discovery, got all the honours. There was no mediocre Amerigo Vespucci to slip in and filch the fame of the Columbus and the Magellan of the New World of graphics. Of course—it was in 1842—Mr. Fox Talbot thought of taking out a patent to compensate himself in some measure for the discovery which he had undeniably and independently made, that sensitive paper during its exposure to the light receives an invisible image, perfect in all respects, and that, in order to render the image visible, it is sufficient to wash the surface of the paper over with gallic acid, or some astringent liquid. But, on reflection, he nobly determined to forego all prospects of profit from his invention, and gave it up unreservedly to the world. In after years he communicated to learned societies at home and abroad the upshot of further investigations into the process of obtaining instantaneous photographs, and the application of his beloved art to engraving on steel. He was an erudite linguist, too, an antiquary, and a cryptologist, and he went on until the end, still acquiring fresh knowledge, and using it, as he had always done, for the benefit of mankind. Fortunately, he was a wealthy country gentleman, without pride, save in that which was good, without ambition, except to serve his fellow-men. He was happily preserved from the indifference of governments and the ingratitude of the mob, although but for the favour of fortune the discoverer of the Talbotype might probably have added another name to the long list of benefactors to their species who have passed their lives in penury and neglect, to die in a garret.

That photography has been an unmingled boon to civilisation it might be difficult to prove. It has been turned occasionally to villainous uses; and, even when considered in its aspect as a hand-maid to art, there may be those who will contend that photography has often shown itself to be an evil counsellor, distorting and exaggerating those very features of nature which, ostensibly, it so unerringly depicts, dulling the painter's fancy, and luring him to slavish adherence to the most prosaic and debasing realism. Could a Raphael or a Michael Angelo have flourished in the presence of photography? Would the works of Titian and Velasquez have been so eagerly sought for if their age had furnished "life-sized photographs" and "album portraits"? All these may be moot points; yet does it seem incontestable that the few drawbacks which may be alleged as marring photographic perfection are more than compensated by the immense amount of social benefit which it has conferred on the world at large. It may be argued that the cheap and inexhaustible resources of photographic printing have paralyzed the art of steel engraving, and killed lithography so far as that art is pictorially employed, and that even wood engraving and typography are not definitively safe; yet, on the other hand, to how many millions has not photography been a convenience, a comfort, and a blessing? The benignant camera is as much the friend of the poor cook-maid as of the crowned head. It will distribute as sincere smiles for sixpence as for ten guineas. It can scarcely have conducted to the enhancement of national vanity, for photography never flatters, and rather amplifies than diminishes our personal defects; but it has been a sure and constant foster-mother of the domestic affections, and, equally with penny postage, it has been the means of strengthening family ties, and alleviating the sorrows of absence. A shilling carte-de-viste travels the whole world over. It is the bringer of good wishes, the harbinger of good news, the remembrancer of old loves. Photography multiplies for an entire household, and for their remotest kindred and friends, the images of the children

in whom we rejoice, and of the dead whom we revere. If the wonderful art had done no more than this, its services as a factor in civilization would still have been stupendous. But it has done much more. Medical, astronomical, botanical, archæological science owe an enormous debt to photography. The traveller, the *savant*, the anatomist, the geologist, the manufacturer, the tradesman, the officer of justice, even as he pursues his prey, are all fain to avail themselves of the camera's assistance; and there is scarcely a department of human knowledge, or an occupation of our daily lives, in which the development of the old Talbotype is not a most valuable adviser, assistant, and expositor. It is, in short, an art as full of grace as of utility; and its discovery, without rebelling Wedgwood, or Boulton, or Brougham, Niepce, or Daguerre of one loaf of their laurels, must shed undying lustre on the name of Fox Talbot.

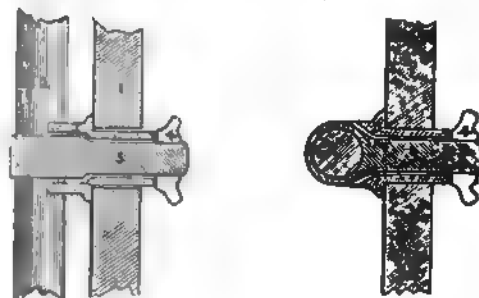
AN IMPROVEMENT IN THE CAMERA FRONT.

BY M. NOTON.*

I EG to submit for the examination of the members of this Society a substitute for the usual slit in the camera front fitted to my rectangular camera, and giving any amount of motion, limited only by the inside of the camera itself. It is perfectly light-tight, very simple, and, although it looks a formidable affair on paper, it is applicable to any size of camera, however large.

The utility of the ball-and-socket mount was checked by the old slit, so there was nothing left but to contrive something better. Now all is clear, and no one need be bothered with the old state of things any more.

The accompanying sketch will, I hope, give an idea of



the arrangement. The left-hand drawing is an elevation, the right-hand one being a plan.

1 represents part of the sliding front.

2 is a round iron rod fixed inside the camera near to the inside face of the sliding front, down towards the bottom and under the lens or up towards the top of the inside, either way. The sliding front has a hole cut through it by a centre bit, midway from each end; this is to allow a brass ferule (3) to pass through to carry the front. This ferule is continued on towards the rod 2. Through the ferule a small wrought-iron eye bolt (5) passes, the left hand end having an eye through which the round rod (2) moves easily; the right-hand end is screwed and furnished with a milled-headed nut (4).

When the nut 4 is screwed up tight it presses against the end of the ferule as an abutment, drawing up the eye-bolt, and with it the rod, against the left-hand end of the ferule; and so, between the two the rod is gripped fast, and the front supported by the ferule, without there being any strain upon it.

In the camera exhibited the rod 2 is eight and three-eighths inches long by one-sixth of an inch diameter, its weight being 329 grains.

The eye bolt, ferule, and nut weigh only 183 grains; the whole apparatus having a (very) gross weight of 512 grains, or just thirty-two grains more than an apothecary's ounce.

* Read before the Manchester Photographic Society.

ON THE USE OF THE ACTINOMETER WITH DRY PLATES.

BY J. H. T. ELLERBECK.*

THE great uncertainty in judging the actinism of light at different times and in different situations has always been a drawback to the use of dry plates in the field, resulting often in under-exposed pictures. We find frequently the prettiest "bits" are in more secluded spots, where much light is lost—how much we could only guess at—wooded glens, deep ravines, trees in the forest, and water-falls, with rocks black with lichens hidden frequently from the light of the sun. How very seldom do we see these correctly timed! I look back with longing regret to hard and worthless attempts of former days, when all was guess-work. Though I often fail now to get good pictures, it is from other causes—such as want of sharpness, and that great bane of photographers, a windy day, with nothing but foliage to do. When, therefore, a correspondent in the *British Journal* suggested the actinometer its value at once struck me, and its use as a move in the right direction. To advocate and explain its use to amateurs is the object of this paper.

The actinometer I use is one issued some years ago by the Autotype Company in connection with carbon printing, and consists of a metal box about one and a-quarter inch square, containing a roll of sensitised paper, which is gradually drawn out. Under a glass lid painted purplish brown, with the exception of a central slot through which the paper is seen, the paper deepens in the light until it assumes a colour similar to the paint around. This is known as a tint.

In ordinary summer sun, using Durand's paper, this takes place in 45 seconds. If, therefore, under other circumstances, it requires more than this, we know the relative strength of the light, and the exposure in the camera must be altered in proportion. Thus, under similar conditions of time and light, a washed collodio-bromide plate, with Ross's rapid symmetrical lens, No. 1 stop, takes 90 seconds. When one tint equals (say) 68 seconds, the exposure necessary is 135 seconds. Practically, I say, such a lens, stop, and plate take two tints, and, if I expose plate and actinometer at the same time, I must register two tints; thus, it does not matter whether the sun shines, or whether the rain comes down in torrents. On the mountain top, by a wooded river, indoors or out, so long as the actinometer registers one tint twice, I know all is right. If No. 2 stop be employed, one tint only is sufficient; if No. 3, half a tint; and if full aperture, a quarter of a tint. If either of the two latter, the time must be known before the exposure commences. If a whole or more tint is given, the two exposures may go on simultaneously. With other lenses and plates different exposures are necessary; each must calculate his own. Supposing, for instance, you would usually give five minutes with a certain stop; this is about equal to seven tints, and so on.

If the exposure is to be more than one tint, it (the measurement) had better go on together to the end. The varying light of a cloudy day is better managed than by simply multiplying the time of one tint as a guide for the remainder. Thus, the first tint may occupy three minutes and the second only one, if the sun breaks away from the clouds. The only objection I have ever heard against this method is that you cannot always place the actinometer in the same strength of light as the subject photographed. I think you can—in most cases at least, and if you cannot it is surely a poor reason for discarding a valuable aid because you cannot under every circumstance avail yourself of it.

But, of course, judgment must be used in its employment. If the subject be in shadow it would be absurd to

put the actinometer in the full glare of the sun. If the camera be in shadow, and the subject an open landscape, the actinometer must go out too. If light is strong it is easy to measure it beforehand, and if weak you will have ample time for walking to and fro from shade to light. There may be cases of insurmountable difficulty, but I have never met with them. The camera itself, or one's own body, will give shadow if this predominate in the picture. One of the last pictures I secured was of a path through the woods, trees overhanging, and the sun behind—a difficult subject, for the camera was in the open facing the sun, which shone on the lens. Shading this, and placing the actinometer at the back of the camera, I gave three tints instead of two, and the result was good. I do not argue that the instrument is automatic. Open, distant landscapes and snow scenes will still take less, and dark, heavy foliage always more, in proportion to ordinary objects. The judgment is helped, not dispensed with.

I have said that one tint is equal to forty-five seconds; this is in the sun, as we in this cloudy, smoky part of England, are accustomed to see it. But on a bright day, in the clear mountain air, I have found thirty seconds was enough, and in other climes even less might do. I remember a remark made lately by one of our members to the effect that in Italy one-half the exposure was given of that necessary in England. By the use of the actinometer all doubt would be at rest. Thus I have noticed a February sun wants two or three minutes; a September sun, at one p.m., two and three-quarter minutes, and at six p.m. ten minutes to form a tint. One cloudy day the light was so weak as to want fifteen minutes, and another, late on in the afternoon, twenty-five minutes. In a chapel, where I tried it lately, I do not think a week would have done it.

Take care always to use the same sensitive paper, as papers vary. I lost some pictures lately from having to beg some from a stranger, having run short of my accustomed Durand's make, and found afterwards it was much more sensitive, though it would not keep a week.

On a windy day an advantage is frequently gained by being able to cap and uncap the lens and actinometer at the same time, at intervals of rest in the foliage, without fear of losing count of time. Lately I adopted this dodge in taking an old house in a narrow street. By this means I escaped the blurs of passing carts and inquisitive Welsh children, who, not being open to reason, could not be driven away.

Of the actinometer itself little can be said. It is not a convenient shape, but is thoroughly efficient, being light-tight and almost air-tight, thus keeping the paper fresh. Those who use gelatine plates would like to register half a tint, and one could easily be made by altering the colour of the paint on the glass lid. A thinner instrument would be handier for the pocket. The Autotype Company make another form more elaborate for carbon printing, showing tint exposure from one to ten. This would be of value only to those who use the slow and sure processes, such as collodio-albumen.

I hope these few rambling remarks will induce amateurs to adopt the method recommended. I feel certain that if once tried it would never be abandoned. It is so easy and so certain, giving no extra trouble, and incurring no expense beyond the cost of instrument (two shillings and sixpence), all anxiety is done away with, and failure from wrong exposure almost impossible. I know that old members of the fraternity will say it is of no use, and that they can calculate the time by the appearance on the ground glass. Still, all amateurs have not the requisite experience, and a safer guide than memory is often desirable, even with the most practised. No one prints in carbon without such a guide; yet, if the results were not good, it is but the loss of a print. Why, then, risk the loss of what might be a valuable negative, which, perhaps, could never be replaced?

* Read before the Liverpool Amateur Photographic Association.

The Photographic News.

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THE INVENTOR OF THE CALOTYPE PROCESS.

THE death of Mr. Talbot has revived, in some degree, the controversies which at different times arose as to his true relation to the discovery of photography. In M. Tisandier's very excellent history of photography, published some time ago, Mr. Talbot's claims to the title of inventor of the art are dealt with in a summary and cavalier fashion. His discovery is pronounced "not practicable," and it is stated that it had not "the good fortune to attract the attention of the learned world." A curious statement, when it is remembered that Mr. Talbot received for it the gold medal of the Royal Society of England. The chief value which it is allowed by the French author is, that it served as a ground-work for the labours of Blanquart-Evrard, who gave it "certainty and facility of working." It was generally acknowledged," M. Tisandier observes, "that the mirror-like character of the Daguerreotype plate was incompatible with a really artistic picture; it was thought, with reason, that a proof on paper would be softer, and would resemble a sapia drawing. Thus, as soon as Blanquart-Evrard, of Lille, published his method, his communications were received with expressions of joy by all photographic amateurs." Although the "Daguerreotype seemed to have the sole right to occupy the attention of Paris," and Talbot's invention was unrecognized, yet the need of photography on paper was recognized, and when Blanquart-Evrard had made the method practicable it was hailed with joy! As we shall shortly be in possession of Mr. Talbot's reply to these statements, it is scarcely necessary to refute them here. In a second edition of M. Tisandier's work, which we are glad to hear is about to be issued, Messrs. Sampson Low and Co. will publish an appendix by Mr. Fox Talbot, giving a history of his early labours in the production of sun pictures. One word on the practical character of the process may not, however, be out of place here. Those who are familiar with the early Talbotype pictures need no assurance of the practicability and excellence of the process. We recently examined a photogenic drawing produced within a few days after first hearing Mr. Fox Talbot read his paper describing the process. This print was still preserved in the small, improvised frame in which it was printed from a piece of lace edging as negative. The print was clean and bright, of a brown tint, having been fixed with bromide of potassium. This was the first photographic print of one who subsequently became one of the very ablest photographic amateurs, Dr. Diamond. No proof could possibly show more conclusively the excellence and practicability of this process than that which has come under our attention in the shape of something like five hundred calotype negatives, ten by eight inches in size, each

as so perfect in definition and in all points of technical as well as pictorial excellence, as to render the examination of them an absolute treat to an educated photographic eye. When we remember, also, the early Calotype landscapes of B. B. Turner, Alfred Roslyn, Llewellyn, and many others, the old masters of photography, and recall to mind the grand series of Calotype portraits by Hill and Adams, which live in the memory of many photographers, we cannot for a moment admit that the process lacked either excellence or practical character. It is true that the inventor was indebted, as many other inventors have been, to the experimental effort and artistic and technical skill of an army of enthusiastic amateurs, for giving value and currency to his discovery, by showing what bright things it was capable of producing. The real basis of a depreciatory estimate of Mr. Talbot's claim arises in the question as to how far he was the actual discoverer of the existence of the latent image on paper, and the use of gallic acid for its development, which careful investigators attribute to the late Rev. J. B. Reade. Daguerre had discovered, by happy accident, the existence of a latent image on the iodized silver plate. By accident, also, Mr. Reade had discovered a similar fact, when using silvered paper in conjunction with an infusion of galls, some time anterior to the date of Mr. Talbot's patent. Sir John Herschel had used iodide of silver. But the philosophical mind of Mr. Talbot saw the significance of all these things, and produced and patented a perfect practical process.

Mr. Talbot's step in protecting his process has been the subject of much challenge. Some have denied his right to patent that which was the partial discovery of others. Many more have questioned his wisdom and good taste, as a wealthy man and votary of science, in thus attempting to lock up such a discovery by patent. The *Athenæum*, in a notice we print on another page, thinks it was unfortunately and unwisely done. Probably it would have been better for his fame, and no worse for his pocket, if he had at once given his discovery to the world. But we are by no means assured that the public and the process are always gainers by such a course. The direct interest of one proprietor in the commercial results of a process is often the surest guarantee of that process being worked out to its best issues, which, if it be the general property of many, is by no means certain. A piece of land forming the garden, orchard, or field of a proprietor is generally well cultivated. A similar piece consisting of common land, where all may gather the produce, is rarely cultivated at all. The *Standard*, in a notice we also reproduce, says either in irony or curious ignorance, Mr. Talbot "thought" of patenting his process, but "on reflection nobly determined to forego all prospects of profit from his invention, and gave it up unreservedly to the world." That Mr. Talbot did not take this course is now notorious to the world. Ten years after the date of his patent he gave it to amateurs, still reserving, probably not altogether unnaturally, his right in its use for professional portraiture. A year or two after that he took steps to secure a renewal of his patent, a course not, however, carried out. In the meantime the case famous in the memory of photographers of Talbot v. Laroche was heard and determined. Mr. Talbot wished to enforce his patent on all portraitists using collodion, on the ground that they used iodide of silver to obtain a latent image, and developed it with pyrogallie acid, which he considered to be protected by his patent, on the score that pyrogallie acid was a sufficiently near equivalent of gallic acid, and a collodion film a sufficient equivalent for paper, to be covered by his patent. He failed in substantiating his claims to the satisfaction of a British jury, and henceforth photography was open to the world.

Mr. Talbot's engraving process, which he also patented, was at that early date a great advance on what had been done, and the specimens which we gave in an early volume of the *Photographic News* will bear examination at the present day. The final invention of Mr. Talbot, which

was also patented, has never, we think, been sufficiently worked out, nor have its suggestions been sufficiently utilized. The subject was instantaneous photography, and the results obtained were very remarkable. A printed paper was fastened to a wheel, which, being made to revolve as rapidly as possible, was illuminated for a moment by the discharge of a Leyden battery. The bill thus illumined by a momentary spark was perfectly reproduced, without blur or imperfection. The method, briefly stated, was as follows:—A plate of glass was evenly coated with equal parts of albumen and water, and dried by heat. It was then dipped into a three-grain solution of nitrate of silver, the solvent being a mixture of alcohol and water. It was then washed in distilled water, and again, when dry, coated with the albumen solution, and dried without much heat. It was then dipped for a few seconds in a solution of photo-iodide of iron, made as follows:—To an aqueous solution of the iodide add an equal quantity of acetic acid, and then ten volumes of alcohol. This must stand for a few days, during which time it will change colour and lose the acid and alcoholic smell, acquiring a vinous odour. It is finally rendered sensitive by immersion in a bath of aceto-nitrate of silver, containing seventy grains of the silver salt in an ounce of water to three parts of the solution, two parts of acetic acid being added. It is then exposed in the camera without delay. The latent image is brought out by an iron developer containing one part of a saturated solution to two or three of water. The image is rapidly developed: fixing with hyposulphate and washing finish the operation. At the conclusion of Mr. Talbot's account of this process he remarks that it consists of "the harmonious combination of several previously-ascertained facts" due to former discoverers; and that the value of the process chiefly consists in the due adjustment of the proportions and in the mode of operating; and adds, that a very slight deviation will not only destroy the exalted sensibility, but often yield scarcely any result at all. The last sentences convey a truth we commend to many thoughtless photographers who try a process imperfectly, and then blame upon the originator or expositor the results of their own failure.

PHOTOGRAPHY AT THE AMSTERDAM EXHIBITION.

WE are favoured by an old and esteemed correspondent, Herr Haakman, with the following interesting details of the Exhibition in Amsterdam, which, it appears, is a decided success:—

Amsterdam, September 21st.

DEAR SIR,—I have the pleasure to write you a few details about our International Photographic Exhibition, which opened last Tuesday, and was visited the following day by H.M. the King and his brother, Prince Henry. I am glad to say our Exhibition is considered a great success. It is held in the galleries of the Art Painters' Society, "Arts, Amicitia"; and as for the hanging of the frames, we had the assistance of a committee from the said painters' club. The different rooms present a really artistic appearance. Our catalogue comprises about fifty contributors, American, Belgian, English, German, Russian, Scotch, Dutch, &c. England is represented by Messrs. David Hedges, J. M. Browning, Hare, S. Fry, &c.; America by Gutekunst of Philadelphia, Kocher of Chicago, and Notman of Canada; Russia by Bergamasco; Belgium, by A. Dandoy; Namur, by A. Cadot; Brussels, by P. Halley; Dinant (Germany), by J. B. Frilner; Bremen, by Geldmacher; Frankfurt-on-Maine, by S. Kiewning; Stettin, by Herman Koch; Waldenburg in Silesia, by Carl Metzner; Coburg, by T. Muller; Munich, by Reichard and Lindner; Berlin, by Martin Kommel; Stuttgart, by Baron Stillfried; Austria, by Taeschler, &c.

As the jury meets on October 4th, and I am one of them, it is perhaps premature to enter into any details as

to the merits of the respective exhibitors; but in my (and I believe the general) opinion, Kocher of Chicago stands first for his portraits, each of which is a perfect gem. Each portrait is a genre picture, and our artists and painters are quite in raptures over them; in fact, there is quite a revolution in photographic portraiture, and totally different from anything I ever saw.

Gutekunst has one frame containing a panorama about six feet long, of the Philadelphia Exhibition Grounds. This said picture was printed from six different negatives on one continuous sheet of paper, but the printing is so well done, and the tone so well kept up, that it is almost impossible to detect the joining. The price asked for this picture is \$200, about £15.

I forgot to mention a large collection of really magnificent landscapes, water-falls, tree studies, dead game, &c., by Mr. Penn, of Ootacamund, British India. In fact, we liked them so well that, although they were sent unmounted, we mounted and framed them at our own expense, as a just contribution to their merits.

If you are agreeable, I shall send you some further details after the jury have made the awards. When there is so much excellence, it is quite impossible to do justice to everybody in a few rapid lines, and I only wish to give a cursory glance at what is, to speak, beyond competition. Every photographer should come to see Kocher's pictures. It will be money well laid out, and paying more than its interest.—Believe me, dear sir, very truly yours,

H. L. T. HAAKMAN.

PORTRAITS IN OIL FOR THE MILLION.

UNDER this title Mr. Solomon is introducing something old enough to constitute one of the greatest and most interesting novelties of the day in connection with photographic portraiture. We have had occasion very frequently of late to notice the methods, often rediscovered, often patented, of colouring photographs at the back, first, of course, rendering the photographs transparent. The principle is a simple one, and, on the very face of the subject, a correct one. It differs from the ordinary method of colouring in the fact that the photograph is superposed upon the colours, instead of being covered up with colours laid on its surface. The principle was, as we have frequently explained, one of the earliest discoveries accessory to photographic portraiture; it has been often patented, and for some strange reason has never come into general use. The probable cause is that, simple as the method seems, it requires some experience for its successful application. Mr. Solomon has recently called our attention to some very admirable examples, and undertakes to do similar work for the "trade," on very reasonable terms. He does not, as he explains, profess to have made any discovery, or introduced any great novelty. He finds a good and simple process in existence which is not generally understood; he undertakes to master its peculiarities, so as to work it well; and, this done, he offers to carry out the work for photographers on terms which will, he thinks, pay portraitists, and enable them to place in the hands of the million of limited means a portrait of excellence, only accessible hitherto to the wealthy. This is the real novelty—the facility for portraitists in any part of the country to obtain high class oil painting in connection with their portraiture on terms hitherto charged for the poorest daubing. The examples we have seen are exceedingly well done and very effective. The likeness, as regards drawing, must be good, as it is simply the photograph itself; the accuracy of colours must depend somewhat upon precision of description. The style is solid and good, with nothing of a common effect. The prints are mounted on canvas, and varnished and mounted in a capital solid gilt frame, at the low price charged, so that the photographer has no trouble whatever. He sends off a good print, and receives back a

fine oil painting, ready for delivery to his sitter. The project deserves success, and will, we doubt not, attain it. Mr. Solomon will have done a good work if he succeed in supplanting many of the common, inartistic daubs which a love for colour aids in carrying into the houses of the uneducated and poor.

THE WARNERKE TISSUE FOR MULTIPLYING NEGATIVES.

We have already referred incidentally to the employment of the Warnerke tissue for the production of transparent positives, and we desire now to say something of its adaptability for multiplying negatives. A rapid method of turning one negative into a dozen must be valuable to all photographers, and in some cases it is only by having such a method at one's finger's ends that it is possible to derive profit and advantage from a cliché in our possession. A great personage who consents to sit for his portrait usually requires that the operations of posing and exposing shall be done in the briefest of intervals, for his time is valuable, and he can give up but a very small portion of it to the photographer. The latter, therefore, can never hope to secure more than one or two favourable clichés, and these must be valued accordingly.

Or, again, when chance or good luck has put us in possession of a plate, the value of this is often confined when we cannot take full advantage of it. The case of the negative taken by a passing travelling photographer of M. Thiers the day before his death is a very good instance of this. Here is a negative of a great man whose name is in the mouth of every-one, but the importance of which (the negative we speak of, and from a commercial point of view) must diminish by the day, nay, by the hour. If the lucky photographer to whom we allude had possessed no ready means of multiplying his single negative, the value of this would have been represented in the main by the number of prints that would be struck off in a fortnight or three weeks. But as he was enabled to produce from his original a large number of duplicates, the value of the former was at once enhanced, and it has realized its happy possessor, we are told, quite a little fortune.

Some experiments we have made with the Warnerke film demonstrate that this material is exceedingly well adapted to the multiplication of negatives. The first thing, of course, is to produce a transparency, and the film employed for the purpose need not to be so highly sensitive. The soft pliable material is treated as if it were albumenized paper, only greater care is taken to keep it sheltered from light. The tissue is laid upon the negative, and printed in the ordinary manner in a printing-frame. It matters little what exposure is given. Half an hour will not hurt, but one or two minutes are of course ample. On taking the film from the pressure-frame the image will be perfectly visible, and on application of the ordinary developer a vigorous positive picture is rapidly evolved. The intensity of this can be governed with much ease. From this positive negatives are printed in exactly the same way, and the circumstance that the tissue is soft and pliable invariably insures contact and the rendering of every detail. When we mention further that the development, fixing, and drying of these over-printed films is so rapid that in a couple of hours half a dozen negatives may be produced, nothing more need be said upon the facility with which the various operations can be carried out.

In conclusion we may say that positives of Warnerke tissue make famous transparencies for the lantern.

NOTE ON EMULSIONS.

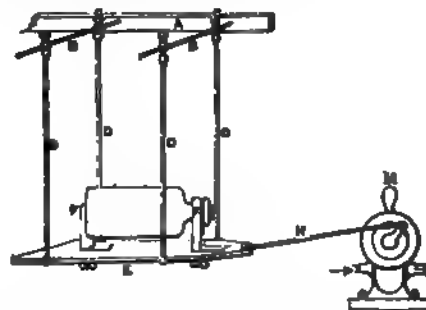
BY M. CH. BARDY.*

I ask the permission of the Society to communicate the results of some experiments I have made upon the inter-

* Read before the French Photographic Society.

esting emulsion process of M. Chardon. It was my desire to render the preparation of the emulsion more easy when operating with relatively large quantities of the material, and at the same time to arrive at a more perfect division of the bromide of silver.

The agitation of the products together is beset with but little difficulty when it is only a question of producing some grammes of material; but it is different when you desire to make several litres of emulsion at one time. In this case the shaking together of the ingredients is a difficult and laborious operation. To remedy matters, I had recourse to a little apparatus constructed by M. Alvergniat, of which below is a sketch:—



Upon a flat rod of iron, A, 60 centimetres long, 3.5 wide, and 1 centimetre thick, are rivetted at right angles two rods of iron, B B, at 1.5 centimetre in diameter, and 35 centimetres long, with spaces between them measuring 45 centimetres. The whole is fixed into a wall. On each of the rods is placed an iron ring, C C, provided with a screw, which serves to hold fast the ring at any point of the rod. Each of the rings, or, rather, clamps, has attached an iron rod, D D D D, 85 centimetres long, terminated at the bottom with a sort of eyelet. The four rods, D D D D, serve to support a little board of oak, E, 55 centimetres long and 20 broad, with supports, F F, so placed as to receive a bottle and fix it in a horizontal position. The whole system forms an articulated parallelogram which obeys the slightest movement.

If a to-and-fro movement is given to the frame the bottle moves forward and backward in a straight line, and thus the liquid contained is vigorously agitated.

This movement may be imparted very easily by having recourse to a little water-engine constructed on the Schmidt system (the model employed for sewing machines), and which has a power of a few kilogrammes only.

It can be readily understood that a small power only is required to set the apparatus going, and to shake up several kilogrammes of liquid, all the weight being supported by the eyelets at C C. The Schmidt machine works day and night without requiring to be watched; the greater and more continued the agitation, the more perfect will be the resulting product. The same apparatus may be employed for redissolving an emulsion in alcohol and ether.

I myself have operated with several litres at a time, and my emulsion leaves nothing to be desired. I may say, however, that, acting upon the suggestion of M. Andra, I introduce the bromised collodion into the warm alcoholic solution of nitrate of silver, without occupying myself about the precipitate that is formed.

The precipitation of the emulsion with warm water I am enabled to bring about without difficulty. I may mention that it is only necessary to press the precipitate moderately; in order to hasten desiccation I have sometimes, indeed, put it under a press. But the result has never been so satisfactory as with the same emulsion simply drained and dried.

To render desiccation more rapid, and, at the same time, more complete, I allow the precipitate to remain upon blotting-paper; I put it under a bell jar upon an air-

pump, and, having placed under the same protection a vessel containing sulphuric acid, I proceed to exhaust the air. The product resulting from such an operation is flocculent, dissolves rapidly in a mixture of alcohol and ether, and furnishes a very delicate film, exempt from all defects.

The operation of drying may, however, be avoided by introducing the precipitated emulsion, while yet wet, in a bottle containing alcohol at 40° Cent. At the end of a few hours the whole is turned out upon a cloth, the precipitate is gently pressed, and then put again to digest in concentrated alcohol. This second bath is for the purpose of eliminating the last traces of water; you drain as before, and the emulsion may be at once dissolved in an alcohol and ether mixture. The litre of collodion, according to M. Chardon, furnishes fifty grammes of perfectly dry emulsion. I recommend this modification in its preparation, for the clichés produced are purer and more brilliant.

If it is preferred to preserve the emulsion in the form of a dry powder, that treated with alcohol will dry more rapidly, and will be found to be in a very favourable state of division for redissolution.

In conclusion, I may mention that during the great heat of the past summer I was compelled to modify in a slight degree the proportions of alcohol and ether indicated for re-emulsion. I employed sixty per cent. of alcohol and forty per cent. of ether. This modification appeared to me necessary in order to avoid a fleeciness which was visible in the collodion when equal parts of alcohol and ether were employed.

So far as I am concerned, I have nothing but praise for M. Chardon's process; the manipulations are simple, and free from all useless complications, and by following exactly the directions laid down, you are sure to secure a successful result.

PROGRESS OF HARDENED GLASS MAKING.

ABOUT two years ago M. Royer de la Bastie produced his tempered glass. It will be remembered that the Bastie process consists in heating the glass object to a red heat in a furnace, and plunging it while in this state into a cooling bath. This method, in common with some others of later date, and based on the same principle, requires that the object shall be completely formed before the hardening operation, and this, besides producing other disadvantages, tends to enhance the cost of manufacture. The glass, when heated to the necessary temperature, becomes so softened that it is almost impossible to transport the object from furnace to bath without some deformation taking place, and to this cause are due the irregularities so often noticeable in tempered glass articles, and notably the departure of window panes from a true plane. There are other disadvantages due to the bath, which is composed of oil or other greasy material heated to a temperature varying between 392° and 572° Fah., according to the quality of glass to be tempered. When the red hot article is plunged in, the oil easily takes fire. This can, of course, be avoided by proper precaution, but it is obviously a source of danger. There are, besides, the disagreeable odour arising from the bath, the large expenditure of oil, which decomposes on contact with the hot glass, and finally the fact that each special composition of glass requires a different temperature of the bath, and it is very difficult to maintain exactly this temperature during the operation. It will thus be clear that in the bath is the weak point of M. de la Bastie's process.

Herr F. Siemens, who has devoted considerable attention to the Bastie plan with the hope of overcoming some of its practical difficulties, appears to have become convinced that the invention is inapplicable to the fabrication of certain forms of glass, among which are included window panes. To these last any hardening process probably finds its most important application. After some experiment

Herr Siemens reached the conclusion that solid bodies, or rather moulds, could be substituted for the cooling bath. His first attempts, made with the object of hardening small squares of glass between plates of baked earth, showed clearly that the idea was practicable. This was eighteen months ago, and during the subsequent interval up to the present Herr Siemens has achieved constantly improving and successful results.

The *Deutsche Industrie Zeitung*, whence we take our facts, states that the method of fabrication of the compressed glass is not merely a glass-hardening process. It constitutes at the same time a veritable method of glass making. Tempering, blowing, and moulding are all accomplished in one and the same operation.

It will be perceived, however, that all objects in glass cannot be made by this process, and that its application is restricted to such as can be pressed between two simple forms. To this category, however, belong window panes, to which at present Herr Siemens proposes to restrict his manufacture. In brief, the Bastie and Siemens methods may justly be regarded as each having its peculiar sphere. Bastie's plan is especially suited for cylinders, hollow glass, and other articles of complicated form, while Siemens' system, as already stated, is best applied to simple figures. The resistance of the Siemens glass to shock is stated to be ten times that of common glass, but its cost is about 50 per cent. higher, except in case of curved window panes, when it is the cheaper. It is said to be harder than other tempered glass, and to present a fibrous instead of a crystalline fracture. It may be polished or pierced without the rupture which occurs in the Bastie glass. Herr Siemens is engaged upon still further improvements, which it is believed will tend to decrease the cost.

At the Lyons Industrial Society, recently, M. Leger proposed tempering bottles and similar glass objects by steam. The tensile resistance of the glass thus prepared, he states, is about equal to that of cast iron. No details of the process are given.—*Scientific American*.

WATERPROOFING PAPER.

AMONGST recent patents which may interest photographers, are three by Mr. Daniel Felton, of Manchester, for rendering paper waterproof. The first process consists of the treatment of the tissue to be waterproofed with chloride, sulphate, or other soluble salt or salts of zinc or cadmium, in conjunction with ammonia, applied in the form of a solution composed of about three parts of crystallised sulphate of zinc, or three parts of a solution of chloride of zinc at 96° (Twaddle), and about two parts of solution of ammonia of specific gravity 875. The paper or cloth which it is proposed to treat is passed through a cistern lined with lead, and specially constructed for this purpose, with an arrangement of rollers, so as to allow the material to pass through at a speed varying from thirty to thirty-six yards per minute, according to the thickness or thinness of the substance at the time under treatment. In its passage through the liquor with which the cistern or bath is charged, the material becomes perfectly saturated and impregnated. From the bath the saturated material passes through a pair of squeezing rollers, which remove the superfluous liquor, and harden by compression the substance submitted to treatment. From the rollers the material is next passed to a suspending apparatus, then hung along the room in folds in a temperature of 110° (Fahrenheit) until it is sufficiently dry to be taken down. The rollers in the cistern, the squeezing rollers, and the suspending apparatus are so speeded that the material is taken from one to the other without any inconvenience or stoppage.

The second process is a treatment with glue, gelatine, or other similar substances, in conjunction with bichromate or chromate of potash, soda, or alumina, applied in the form of a solution of about one part of glue or gelatine

in about eight parts of hot water at 160° (Fahr.), and a solution of about one part of bichromate of potash in about fifteen parts of water, or a solution of the before-mentioned bichromates or chromates in the same proportions. The mode of treatment in this case differs from the former only in two points:—1st. During the time the material is traversing through the bath, as already described, the solution is maintained at 160° Fahr. by means of siphon pipes charged with steam. 2nd. Instead of suspending to dry, the material is immediately passed over three steam cylinders seven feet in diameter, carrying a pressure of fifteen pounds to twenty pounds to the square inch. The cylinders are provided with gauges to indicate the pressure they are required to carry, and also with safety-valves to prevent this pressure from being exceeded. Although the bath is always in a state of darkness, yet it is specially necessary in this case, for without this the process of waterproofing the material by means of chromates or bichromates could by no possibility be accomplished.

"3rd. By treatment with acetate, sulphate, or chloride of alumina, applied in the form of a solution of about one part of any of these compounds in about six parts of water at 160° Fahr. The same conditions are required to produce a waterproof material with these compounds as those described above, with this difference, that it is not absolutely necessary to preserve darkness during the process. The claim of the patentee is thus worded:—

"Each of the foregoing processes I claim as my invention for the production of waterproof paper, cotton, or linen cloths, or other ligneous tissues. Paper and cloth may be taken together, through the treatment which, by its adhesive nature, binds the two together—thus giving a durable, pliable, and impermeable material suitable for any purpose where immunity from damp and moisture is required."

If the paper employed for silver prints could be made waterproof, it is probable that such an operation would tend towards permanency, and it is not improbable that a modification of some of the processes above described might be rendered available.

Correspondence.

LOCALIZING DEVELOPMENT IN CARBON PRINTING.

SIR,—By the following simple method I have succeeded perfectly in localizing and accelerating the development of carbon prints, and I now use it in daily practice. The method is as follows:—

I take a small piece of very soft wash-leather and wrap it round the finger; then dip it into a cup of warm water to which a few drops of ammonia have been added; then gently rub the portions of the carbon print that appear too dark and lacking in detail. For instance, it sometimes happens that the hair appears too dark and lacking in detail (especially in a Rembrandt picture), whilst the face and lighted portions are everything that could be desired.

Now, by adopting the method I have described, I find it possible to bring all the detail out in the darker portions and shadows, whilst the lighter parts are not in the least degree affected.

It is also a very rapid and easy method of reducing a rather over-exposed print, and by using the water hotter or colder, as the case may be, you have perfect control over the result. I find that it also cleans the surface of the tissue from all specks or dust that are liable to become attached to it from the washing-water or other causes, and which are very difficult to remove by an ordinary stream of water.

It is astonishing what an amount of friction the tissue will bear with the moistened wash-leather without in the least degree injuring the surface.

Should you think it worth while to give this a place in the columns of your valuable periodical, you are at liberty to make what use you like of it; if not, consign it to the waste-paper basket.—Yours obediently, THOS. B. LATCHMORE.

AMATEUR PHOTOGRAPHY IN THE WEST INDIES.

DEAR SIR,—Do you think the following worthy a corner in your valuable publication? I have been dabbling in photography, off and on, for the last twelve or thirteen years. When I commenced I found great difficulty in obtaining a correct focus. I removed the lens, and with a rule measured the distance from the lens aperture to the focussing glass; I then put in a plate-holder with a glass and measured, but found the distances did not coincide. To remedy this I adopted the following plan, and have had no difficulty since:—I take a plate and gum over it the thinnest and finest tissue paper I can get; when dry, I rub it with a little oil. This makes a capital focussing glass. When I wish to focus an object, I put this into the plate-holder and focus from it. When I afterwards insert the sensitized plate it necessarily occupies the precise place as the focussing glass. I enclose two views, one of Hope Vale Sugar Works, the other of part of the Carenage with Government House in the distance; and I think you will admit a want of sharpness is not one of the many other defects. The views were taken some years ago, and have been recently printed upon plain salted paper. The exposure was about eight minutes, with $\frac{1}{4}$ inch aperture, and by the wet process.

I have once or twice tried dry processes, but with indifferent success. I am now seeing what the emulsion system will do in my hands, and, so far, I think I shall succeed. The greatest difficulty we have to contend with in tropical climates is the dampness of the atmosphere. In rainy weather—that is, during the wet season—the plates soon spoil. I am following the instructions given by "Photo-Chemicus," at page 130 of your YEAR-BOOK 1877, with the exception that, not finding the gelatine solution adhere to the glass, but run into patches, I apply albumen, white of one egg, 20 ounces water, 1 ounce strong ammonia as given by Jabez and Alfred Hughes, p. 49 of the YEAR-BOOK. The egg is shaken in a bottle (as recommended by Mr. Hughes in his work on Photography) with pieces of broken glass—I think a plan quite as efficient as, and much less trouble than beating with a whisk.

I notice different writers referring to the apertures with which they take views describe them by numbers. Now as I have not met with any description of these numbers as to the fractional parts of an inch they represent, I shall feel obliged if you will give me the corresponding sizes. In Mr. Rouch's Catalogue, 1877, p. 95, he has this: "with an aperture of $\frac{1}{36}$." Please what does that represent? As I expect the plates mentioned on that page are the emulsion plates above referred to, I am anxious to know the exposure required under the different apertures. I tried one with the $\frac{1}{36}$ aperture this morning, and exposed for half an hour, but with an indifferent result; however, I can account for that, as I tried to dissolve the nitrate in absolute alcohol when making the emulsion, and found it did not quite succeed; I ought to have used methylated.

"Photo-Chemicus" in his formula for the developer has omitted to say his pyro solution should be in alcohol. (See Mr. Rouch's formula, page 95 of the catalogue).

The likeness sent is printed upon Hone and Thorne-thwaite's albumenized paper that I have had by me for the last ten or twelve years. It is in a long tin case, and seems to keep remarkably well.—Yours very truly,

J. F. GRESHAM.

[The examples our correspondent sends are exceedingly creditable work when the difficulties are taken into account. He will find that the least troublesome plan is to adjust the ground glass so that it coincides with the position of the sensitive plate. The salted paper prints were a very good tone. The practice of numbering stops is adopted by

opticians, and the numbers have reference simply to the graduated apertures of each particular set, and have no relation to any recognized standard of size. It would be more convenient if a certain number really indicated a certain measurement. The aperture marked thus $\frac{f}{10}$ means that the aperture is one-tenth of the focus. The case to which he refers $\frac{f}{15}$ means that with a lens of fifteen inches focus, the aperture is half an inch. In making emulsions either methylated or pure spirit may be used; but it must contain a trace of water to secure solution of the silver salt. The YEAR-BOOK for 1876 is in print, and has been forwarded.—ED.]

A SIMPLE CARBON PRINTING WITHOUT PRINTING FRAME, ETC.

SIR,—The following may interest your readers:—Take carbon tissue from biobromate bath directly to the varnished negative, which is covered with wax and collodion, when dried, expose, and wash with warm water as usual. The autotype tissue will stick to the varnished negative more tenaciously than when after exposed. The carbon tissue can be made according to M. Fargier's, or Mr. Blair's, or Mr. Swan's process. The patent of the latter will expire next February, and other Woodburytype can be made with the above process easily. CARELESS OPERATOR.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on Thursday evening, the 2nd ult., at the Free Library, William Brown Street,—the REV. H. J. PALMER, President, in the chair.

THE SECRETARY read several letters, and showed some photographs that had been sent in from which to select a presentation print, but the Council considered it advisable to wait, in order, if possible, to obtain a suitable negative from those belonging to members.

Mr. Edward Le Robert's and Mr. Edward S. Seddon were elected members of the Association.

Mr. J. H. T. ELLERBECK read a paper on "The Use of the Actinometer with Dry Plates" (see page 478). He (Mr. Ellerbeck) showed some specimens of simple actinometers, which could easily be made and carried in the waistcoat pocket.

Mr. W. H. WILSON, in moving a vote of thanks to Mr. Ellerbeck for his paper, stated that the use of an actinometer is an undoubted advantage. He (Mr. Wilson) had on a former trip to the Continent found the light there so deceptive that he ought to have given exposures three times longer than he had done. On his last trip he took with him a slip of Durand's sensitized paper, and by noting the time it took to change to a certain tint he found he was able to judge the time of the exposure of his plates accurately, and had not under-exposed a single picture.

Mr. W. H. KIRKBY said he had been trying different samples of sensitized papers, and showed prints from the same. He had tried the borax bath, but in using the acetate bath, which he preferred, he had been recommended to add two grains of washing soda to the pint, and found it an improvement in toning Durand's paper.

THE PRESIDENT said that some of the plates he had coated for the members at their last meeting had been failures in their hands, while those of the same batch worked well with him. One, which he would pass round—an interior of the Walker Art Gallery—he thought was one of the best he had ever taken. He (the President) had tried an experiment, and found that he could coat twice as many plates with gelatine emulsion as he could with the same quantity of collodio-bromide emulsion.

A number of prints were exhibited by Messrs. Ellerbeck, Kirkby, Roper, Potter, and others.

Some charming prints were shown by the Secretary. They had been taken by Mr. Ellerslie Wallace, of Philadelphia, during a recent visit to this country, and attracted universal admiration.

After spending some time in examining a variety of things interesting to amateurs, which were exhibited by Mr. Ellerbeck, the meeting was adjourned until the 25th instant.

Talk in the Studio.

MR. SHERIFF NOTTAGE.—The *City Press* gives some interesting details of the history and antecedents of one of the gentlemen whose enterprise and ability are very familiar to the photographic world, and who, by his civic honours, confers distinction on photography. "Mr. Alderman and Sheriff Nottage is descended from the family of the Nottages, of Nottage, in Glamorganshire, who afterwards settled in Essex, in which county he spent his early youth. He is fifty-one years of age, and was married in 1851 to Christiana, daughter of Mr. James Warner, belonging to an old Cheshire family. His residence is at 35, Collingham Road, South Kensington, and his family consists of a son and daughter. He was for many years engaged in the large iron business of his uncle, Mr. B. W. Kennard, the late member for Newport. Mr. Nottage is a nephew of the late Mr. Alderman Challis, who for many years represented the borough of Finsbury in Parliament; and, strange to say, Mr. Kennard and Mr. Alderman Challis served the office of Sheriff of London and Middlesex during the same year. The Alderman was, a few years since, a candidate for a seat at the board of the Union Bank of London, which he lost only by a few votes, gaining, however, a moral victory by securing a majority of one hundred and nine of the proprietors over his opponent, Major Walker. Mr. Nottage having from his earliest years evinced a taste for the fine arts, and the stereoscope having then been invented, he saw that by this instrument in connection with the undeveloped art of photography, if brought out on commercial principles, a large and lucrative business might be established, and he at once threw his energies into the new enterprise, under the title of the London Stereoscopic Company, which has since developed into the largest concern of the kind, with agencies in various parts of the world. Sir David Brewster, the inventor of the stereoscope in its present popular form, at once interested himself in the development of his ingenious idea, and a prize being offered by Mr. Nottage for the best essay on the new optical instrument, he became the adjudicator, awarding it to Professor Louie. In 1862 the London Stereoscopic Company undertook the largest contract ever known in connection with photography, viz., that of the Great International Exhibition, purchasing from the Royal Commissioners, for a large sum, the exclusive rights of producing and selling photographs in the new building. The *chef d'œuvre* of modern sculpture, 'The Sleep of Sorrow and Dream of Joy,' by Monti, and Magni's celebrated 'Reading Girl,' there exhibited, being secured by him from those eminent sculptors. Mr. Nottage is not unknown in connection with literature, having some years since published, under the nom de plume of 'Persius Junior,' a series of amusing and trenchant sketches of character, and also having produced *The Shakespearean Diary*, under the initials of 'G. S. N.' Mr. Alderman Nottage is a member of the Spectaclemaker's Company."

ALDEGREYER'S ORNAMENTAL WORK.—"An album of photographic reproductions of Heinrich Aldegrever's ornamental work," says the *Academy*, "has just been published by the firm of H. Manz, at Munich. Aldegrever was a 'Little Master,' who, besides his small engravings of classical and other subjects, executed a large amount of ornamental designs for goldsmiths' work, book-decoration, and other purposes. A number of his plates of this kind are in the Royal Cabinet of Prints at Munich, and these have now been reproduced by J. B. Obernetter, whose skill in this kind of work we have before had occasion to commend. It is hoped that the Album will be found useful in schools of design, by giving a knowledge of a peculiarly German and fantastic mode of decoration."

PHOTOGRAPHERS' TOUTS.—*Figaro*, in giving some details of the history of a "fire eater" in a showman's caravan, gives some details of the antecedents of the photographer's "tout," who has generally been, it is stated, a "super" on the stage! "When this unlucky individual retired from his super's life, as I have said, he did not take to the fire-eating at once, but became the tout for a cheap photographer in the Euston Road. On questioning him further on this point, he informed me that these touts have almost, without exception, been on the stage. More than this, those who come from before the footlights to this occupation have, like Sterck, had tragic aspirations, and in many instances have actually been popular tragedians at the minor provincial theatres. The cause of their fall is usually,

in about eight parts of hot water at 160° (Fahr.), and a solution of about one part of bichromate of potash in about fifteen parts of water, or a solution of the before-mentioned bichromates or chromates in the same proportions. The mode of treatment in this case differs from the former only in two points:—1st. During the time the material is traversing through the bath, as already described, the solution is maintained at 160° Fahr. by means of siphon pipes charged with steam. 2nd. Instead of suspending to dry, the material is immediately passed over three steam cylinders seven feet in diameter, carrying a pressure of fifteen pounds to twenty pounds to the square inch. The cylinders are provided with gauges to indicate the pressure they are required to carry, and also with safety-valves to prevent this pressure from being exceeded. Although the bath is always in a state of darkness, yet it is specially necessary in this case, for without this the process of waterproofing the material by means of chromates or bichromates could by no possibility be accomplished.

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Talk in the Studio.

MR. SHERIFF NOTTAGE.—The *City Press* gives some interesting details of the history and antecedents of one of the gentlemen whose enterprise and ability are very familiar to the photographic world, and who, by his civic honours, confers distinction on photography. "Mr. Alderman and Sheriff Nottage is descended from the family of the Nottages, of Nottage, in Glamorganshire, who afterwards settled in Essex, in which county he spent his early youth. He is fifty-one years of age, and was married in 1851 to Christiana, daughter of Mr. James Warner, belonging to an old Cheshire family. His residence is at 35, Collingham Road, South Kensington; and his family consists of a son and daughter. He was for many years engaged in the large iron business of his uncle, Mr. B. W. Kennard, the late member for Newport. Mr. Nottage is a nephew of the late Mr. Alderman Challis, who for many years represented the borough of Finsbury in Parliament; and, strange to say, Mr. Kennard and Mr. Alderman Challis served the office of Sheriff of London and Middlesex during the same year. The Alderman was, a few years since, a candidate for a seat at the board of the Union Bank of London, which he lost only by a few votes, gaining, however, a moral victory by securing a majority of one hundred and nine of the proprietors over his opponent, Major Walker. Mr. Nottage having from his earliest years evinced a taste for the fine arts, and the stereoscope having then been invented, he saw that by this instrument in connection with the undeveloped art of photography, if brought out on commercial principles, a large and lucrative business might be established, and he at once threw his energies into the new enterprise, under the title of the London Stereoscopic Company, which has since developed into the largest concern of the kind, with agencies in various parts of the world. Sir David Brewster, the inventor of the stereoscope in its present popular form, at once interested himself in the development of his ingenious idea, and a prize being offered by Mr. Nottage for the best essay on the new optical instrument, he became the adjudicator, awarding it to Professor Louie. In 1862 the London Stereoscopic Company undertook the largest contract ever known in connection with photography, viz., that of the Great International Exhibition, purchasing from the Royal Commissioners, for a large sum, the exclusive rights of producing and selling photographs in the new building. The *chefs d'œuvre* of modern sculpture, 'The Sleep of Sorrow and Dream of Joy,' by Monti, and Magni's celebrated 'Reading Girl,' there exhibited, being secured by him from those eminent sculptors. Mr. Nottage is not unknown in connection with literature, having some years since published, under the nom de plume of 'Persius Junior,' a series of amusing and trenchant sketches of character, and also having produced *The Shakespearian Diary*, under the initials of 'G. S. N.' Mr. Alderman Nottage is a member of the Spectaclemaker's Company."

ALDEGREYER'S ORNAMENTAL WORK.—"An album of photographic reproductions of Heinrich Aldegrever's ornamental work," says the *Academy*, "has just been published by the firm of H. Manz, at Munich. Aldegrever was a 'Little Master,' who, besides his small engravings of classical and other subjects, executed a large amount of ornamental designs for goldsmiths' work, book-decoration, and other purposes. A number of his plates of this kind are in the Royal Cabinet of Prints at Munich, and these have now been reproduced by J. B. Obernetter, whose skill in this kind of work we have before had occasion to commend. It is hoped that the Album will be found useful in schools of design, by giving a knowledge of a peculiarly German and fantastic mode of decoration."

PHOTOGRAPHERS' TOUTS.—*Figaro*, in giving some details of the history of a "fire eater" in a showman's caravan, gives some details of the antecedents of the photographer's "tout," who has generally been, it is stated, a "super" on the stage! "When this unlucky individual retired from his super's life, as I have said, he did not take to the fire-eating at once, but became the tout for a cheap photographer in the Easton Road. On questioning him further on this point, he informed me that these touts have almost, without exception, been on the stage. More than this, those who come from before the footlights to this occupation have, like Sterck, had tragic aspirations, and in many instances have actually been popular tragedians at the minor provincial theatres. The cause of their fall is usually,

in about eight parts of hot water at 160° (Fahr.), and a solution of about one part of bichromate of potash in about fifteen parts of water, or a solution of the before-mentioned bichromates or chromates in the same proportions. The mode of treatment in this case differs from the former only in two points:—1st. During the time the material is traversing through the bath, as already described, the solution is maintained at 160° Fahr. by means of siphon pipes charged with steam. 2nd. Instead of suspending to dry, the material is immediately passed over three steam cylinders seven feet in diameter, carrying a pressure of fifteen pounds to twenty pounds to the square inch. The cylinders are provided with gauges to indicate the pressure they are required to carry, and also with safety-valves to prevent this pressure from being exceeded. Although the bath is always in a state of darkness, yet it is specially necessary in this case, for without this the process of waterproofing the material by means of chromates or bichromates could by no possibility be accomplished.

"3rd. By treatment with acetate, sulphate, or chloride of alumina, applied in the form of a solution of about one part of any of these compounds in about six parts of water at 160° Fahr. The same conditions are required to produce a waterproof material with these compounds as those described above, with this difference, that it is not absolutely necessary to preserve darkness during the process. The claim of the patent is thus worded:—

"Each of the foregoing processes I claim as my invention for the production of waterproof paper, cotton, or linen cloths, or other ligneous tissues. Paper and cloth may be taken together, through the treatment which, by its adhesive nature, binds the two together—thus giving a durable, pliable, and impermeable material suitable for any purpose where immunity from damp and moisture is required."

If the paper employed for silver prints could be made waterproof, it is probable that such an operation would tend towards permanency, and it is not improbable that a modification of some of the processes above described might be rendered available.

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After spending some time in examining a variety of things interesting to amateurs, which were exhibited by Mr. Ellerbeck, the meeting was adjourned until the 25th instant.

Talk in the Studio.

MR. SHERIFF NOTTAGE—The *City Press* gives some interesting details of the history and antecedents of one of the gentlemen whose enterprize and ability are very familiar to the photographic world, and who, by his civic honours, confers distinction on photography. "Mr. Alderman and Sheriff Nottage is descended from the family of the Nottages, of Nottage, in Glamorganshire, who afterwards settled in Essex, in which county he spent his early youth. He is fifty-one years of age, and was married in 1851 to Christiana, daughter of Mr. James Warner, belonging to an old Cheshire family. His residence is at 35, Collingham Road, South Kensington, and his family consists of a son and daughter. He was for many years engaged in the large iron business of his uncle, Mr. R. W. Kennard, the late member for Newport. Mr. Nottage is a nephew of the late Mr. Alderman Challis, who for many years represented the borough of Finsbury in Parliament; and, strange to say, Mr. Kennard and Mr. Alderman Challis served the office of Sheriff of London and Middlesex during the same year. The Alderman was, a few years since, a candidate for a seat at the board of the Union Bank of London, which he lost only by a few votes, gaining, however, a moral victory by securing a majority of one hundred and nine of the proprietors over his opponent, Major Walker. Mr. Nottage having from his earliest years evinced a taste for the fine arts, and the stereoscope having then been invented, he saw that by this instrument in connection with the undeveloped art of photography, if brought out on commercial principles, a large and lucrative business might be established, and he at once threw his energies into the new enterprise, under the title of the London Stereoscopic Company, which has since developed into the largest concern of the kind, with agencies in various parts of the world. Sir David Brewster, the inventor of the stereoscope in its present popular form, at once interested himself in the development of his ingenious idea, and a prize being offered by Mr. Nottage for the best essay on the new optical instrument, he became the adjudicator, awarding it to Professor Louie. In 1862 the London Stereoscopic Company undertook the largest contract ever known in connection with photography, viz., that of the Great International Exhibition, purchasing from the Royal Commissioners, for a large sum, the exclusive rights of producing and selling photographs in the new building. The *chefs d'œuvre* of modern sculpture, 'The Sleep of Sorrow and Dream of Joy,' by Monti, and Magni's celebrated 'Reading Girl,' there exhibited, being secured by him from those eminent sculptors. Mr. Nottage is not unknown in connection with literature, having some years since published, under the *nom de plume* of 'Persius Junior,' a series of amusing and trenchant sketches of character, and also having produced *The Shakespearian Diary*, under the initials of 'G. S. N.' Mr. Alderman Nottage is a member of the Spectacle-maker's Company."

ALDEGREVER'S ORNAMENTAL WORK.—"An album of photographic reproductions of Heinrich Aldegrever's ornamental work," says the *Academy*, "has just been published by the firm of H. Manz, at Munich. Aldegrever was a 'Little Master,' who, besides his small engravings of classical and other subjects, executed a large amount of ornamental designs for goldsmiths' work, book-decoration, and other purposes. A number of his plates of this kind are in the Royal Cabinet of Prints at Munich, and these have now been reproduced by J. B. Obernetter, whose skill in this kind of work we have before had occasion to commend. It is hoped that the Album will be found useful in schools of design, by giving a knowledge of a peculiarly German and fantastic mode of decoration."

PHOTOGRAPHERS' TOUTS.—*Figaro*, in giving some details of the history of a "fire eater" in a showman's caravan, gives some details of the antecedents of the photographer's "tout," who has generally been, it is stated, a "super" on the stage! "When this unlucky individual retired from his super's life, as I have said, he did not take to the fire-eating at once, but became the tout for a cheap photographer in the Euston Road. On questioning him further on this point, he informed me that these touts have almost, without exception, been on the stage. More than this, those who come from before the footlights to this occupation have, like Sterck, had tragic aspirations, and in many instances have actually been popular tragedians at the minor provincial theatres. The cause of their fall is usually,

he further informed me, a 'goneness' at the knee, and a break down of the voice, which degenerates into what is popularly known as the 'gin whisper,' after a long course of tragical ranting, and frequent libations of the juice of the juniper berry, the favourite drink of the heavy tragedian, I understand. Sterck assured me that of the thirteen touts he knew between King's Cross and Portland Road station, no less than eight had been tragedians, two had been dramatic authors, one a Plymouth Brethren Evangelist, whilst of the other two he had been unable to discover their antecedents, though he thought they had been 'Turkish bath attendants,' till they became too limp to be of future use. Sterck did not long remain in the cheap photographer's employ. He was put in a semi-military uniform, and told to wink at the 'gale' on Sundays, two things that sorely troubled his gloomy soul. In fact he altogether mistook his calling when he became a tout of this sort, for, as his master plainly told him, his face was enough to frighten away all the would-be customers, who would imagine he (Tom Sterck) wished them to walk in to have their funeral cards printed in advance, rather than to have likenesses executed in first-class style, frame and glass included, for 1s."

OBTAINING MONEY UNDER FALSE PRETENCES.—At Bow Street, Charles Orsich, described as a photographer, of 352, Strand, was summoned before Mr Vaughan for obtaining money by false pretences. The defendant did not appear. Mr. Abrams, who appeared for the prosecution, said that for a long time past the defendant had been carrying on a system of fraud by advertising in different newspapers, mostly in the *Daily Chronicle* and *Daily Telegraph*, for young women to learn the business and assist in the photographic department. In order to entice people, and to give the business an air of probability, he had outside his shop a number of photographs of well-known persons—among them that of Mr. Beard, the solicitor, in his dress as Under-Sheriff of the City of London—entirely without those person's consent. In reality no business was carried on there, and the defendant and his wife lived entirely on what-ever premiums they could obtain from their victims. There were at present in court more than twenty young ladies who had been victimized, and who had paid premiums, amounting altogether to some £160, within the last six months, for situations with the defendant, where they could learn the photographic business. There was every reason to suppose the defendant had absconded, but the wife was still there, and declined to give up the clothes of two of the young ladies whom her husband had swindled. Mr. Vaughan directed an officer to go down and get the clothes for the young women, and ordered a warrant to be issued on a sworn information drawn up by Mr. Abrams for the apprehension of the defendant. George Wetton, one of the summoning officers of the Court, went down to the house in the Strand where the defendant occupied rooms on the second floor, and obtained the clothes of the young women.—*Times*.

INFLUENCE OF LIGHT ON THE ELECTRIC CONDITION OF METALS IN SALINE SOLUTIONS.—Metal plates were placed by Herr Hankel, one in a porous battery cup (closed by a cork) the other in a transparent exterior vessel. The vessels were filled with solution and enclosed in a blackened box in which was an aperture which could be closed at will, or before which coloured screens could be placed. With two plates of polished copper, plunged in water, the plate on which the sunlight fell was negative. The action of coloured rays reached its maximum in the blue. When the copper became more or less strongly oxidized or covered with salts, the plate, at first positive, then became negative, and kept its sign when the light was altogether suppressed. The action is ascribed principally to the feebly refrangible rays, while the dark blue or violet rays render the plate negative. Polished copper in sulphate of copper became first negative, and then strongly positive. Other metals gave the following results:—Clean plate of polished silver, in water, negative; lightly silvered platinum, positive; silver, covered with platinum, strongly positive; tin, negative; brass acted like oxidized copper. Amalgamated zinc, in solution of ZnO_2So_4 , strongly negative; ordinary zinc, nearly neutral (hence the action of the battery is due to the oxidized copper); and platinum, weakly positive. The author has also studied the action of heat on the zinc-copper-water element, of which he states the electric motive force becomes augmented, while it is enfeebled by light.—*Scientific American*

To Correspondents.

M. C. BRY.—We presume that a photographic chemist, if he did not keep it, would procure it for you. We have not occasion to purchase, and do not know certainly who keeps it. 2. We are not sure that any dry plates are specially suited for portraiture. The best portraits we have seen produced by the aid of dry plates were from coffee plates by Mr. Whitehead.

R. GORDON.—The addition of just sufficient ether for the purpose is the simplest mode of restoring the proper limpidity, and getting rid of the lumpy, irregular film.

H. W. M.—We do not make any charge to our correspondents for information or advice, but have pleasure in giving them the best information we can in this column quite freely. Write as often as you need advice or information. Pyrogallic acid is the best developer for opal pictures, and it is quite possible to get a warm tone; but that depends on many conditions. The bath must be in good condition, and moderately new. The collodion should be ripe. Then give a full exposure and rapid development. Make it a rule only to work in a good light, as you cannot get good results in this line without good light. Use three grains of pyrogallic acid, two grains of citric acid, and twenty minims of acetic acid to an ounce of water. Remember that a full exposure and rapid development will tend to warmth of tone, if you have to push the development you produce black tones by prolonged development. Bear in mind that the same conditions which would produce a weak, thin, grey, negative will produce a poor thin image on opal.

S. B.—We regret that we cannot in this column give you detailed instructions, as they would require too much of the space devoted to answering correspondents. You will find full instructions on p. 40 of our Year-Book for 1870. But you will bear in mind that any method of photographing direct on painter's canvas is a somewhat dangerous method to adopt for the basis of an oil painting, as it is very difficult to remove the hyp, used for fixing, as canvas cannot be washed as a print on paper can. The plans considered best in the present day are transfer processes, either a collodion print or a carbon print transferred to canvas making a much more trustworthy basis for a painting in oil.

H. SYMONDS.—Your letter arrived too late for answer in last News; but, as you would see, the information as to the date of sending in was furnished in Mr. Pritchard's note of reminder. The Exhibition opens next Tuesday evening.

TRANSFER, R. B.—The Autotype Manual gives full instructions for transferring carbon prints to canvas. We have never tested the method there described, but we have years ago used a somewhat similar method. We first washed the face of the canvas with soap and warm water, using a piece of flannel to thoroughly remove grease, &c., finally rinsing with alcohol. We then treated its surface with a very weak solution of gelatine to which a little spirit was added. We then applied the developed print to the surface of the canvas, which was, of course, moistened, and pressed the two well together. On lifting the canvas afterwards, when all was dry, it brought the print with it.

A. BELGIAN SCHREIBER.—We have never found a bath of pure india-rubber contaminates the silver bath or causes it to discolour, and we should be disposed to believe the result you describe to be caused by some adulteration or impurity in the india-rubber. Probably varnishing with shellac will prove a remedy.

ENR.—We have no means of knowing any method of securing an engagement as a photographer in Gibraltar. There is nothing, we fear, but trying the experiment.

JAMES HARVEY.—There is no difficulty in producing transparencies by the wet process without a camera, but such transparencies are not perfect enough for enlarging purposes, as they are not quite sharp. A strip of stout writing paper or thin cardboard is laid each time at each end of the negative, and the wet plate placed in contact. The loss of definition is not serious, but too serious to be amplified in enlargements. It is possible to place the sensitive plate in direct contact with a varnished negative, but it requires much care, and involves some risk. 2. "Harmonious Colouring Applied to Photographs," published by Newman, Soho Square, will answer your purpose.

G. W. G.—It is not customary to make any acknowledgment of photographs sent for registration except in the News at convenient intervals. The expense of the operation would be increased if it involved much correspondence.

T. H. CHURCH.—There is no fault in the toning of the print you enclose; it simply required a good deal of over printing. 2. The spots on the piece of paper enclosed arise from the paper having been in contact with some injurious substance before placing in the silver bath. Hypsulphite appears to have been the substance. Never change the dishes from one use to another. Have suff sent for each purpose, and keep each to its purpose. 3. We cannot recommend any special paper. The dry process you name is one of the best and simplest. The mode of development was given in a subsequent number. You will find it all detailed in the last Year-Book of Photography. The plates must be changed in the dark.

The Photographic News, October 12, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. A READY MEANS OF SECURING NEGATIVES FROM MAPS OR PAPER PRINTS.—PHOTOGRAPHS FROM THE SEAT OF WAR.

A Ready Means of Securing Negatives from Maps or Paper Prints.—We have spoken on several occasions in these columns upon the application of the flexible film of Mr. Warnerke to the reproduction of clichés and negatives, but one of the most important uses to which we have seen the emulsion tissue put is that of copying maps and paper photographs. For military purposes the method will be invaluable, for the Warnerke tissue offers not only a rapid means of disseminating the work, but of preserving the finest details of the original. An ordnance map, the fine shading and dotted lines of which cannot but suffer when reproduced by means of the camera, are preserved intact by contact printing in a pressure frame with the Warnerke film, for neither one nor other of the surfaces being rigid, the two can be pressed into immediate contact. At the same time, a whole mass of operations fall away at one time, and only those who know what it is to reproduce plans and maps, whether for photo's, lithographic or simple photographic printing, can thoroughly appreciate what this means. The setting up of the original at a perfect right angle to the lens, the fixing of a central point, and the focussing of the lens so that the lines shall be as sharply defined as possible, are all of them laborious and time-taking operations. In lieu of them the map or plan is simply placed in contact with the tissue, the two prepared surfaces together (that is, the printed face of the map and the sensitive surface of the tissue), and the light is then permitted to act through the paper of the map upon the film. Curiously enough, there is in the result no trace of any texture from the paper, whether it is because the comparatively long exposure given in printing (a few minutes) diffuses the action of the light, or that, no gloss being employed at the back of the film, there is no chance of any reflection or refraction taking place. Even delicate photographic prints we have seen dismounted from cardboard, and placed in this way in contact with the tissue, the result being a capital negative that yields impressions hardly to be distinguished from the original. In fact, any photographer who possesses so much as a *carte-de-visite* may in this way put himself in possession of a dozen negatives from the same in a few hours. In one or two instances, we must admit, we have been unable altogether to get rid of a slight trace of texture where the photograph has been printed upon very thickly albumenized paper, but even in these cases the defect was only visible to an experienced eye. The great thing is to give thorough exposure, for the Warnerketissue, if it is always convenient, is apt, at times, to be a little insensitive. But employed in this way, printing in a good light for three or four minutes means, of course, a very long exposure, and you will find that with such a printing the tissue bears a very visible image, which on development comes out with singular detail. Although it is generally supposed that in developing emulsion films very much over-exposed a necessity exists for reducing the strength of the alkaline solutions, we must frankly say that we have never found this to be really called for. In other words, the solution which Mr. Warnerke recommends for the ordinary development of his tissue, after exposure in the camera, we find not too strong for the development of a sensitive surface which has been exposed behind a map on plate paper, or an ordinary albumenized print, for three or four minutes. The image comes up quickly, it is true, but every detail arises prominently and at once, so that there is no reason to press the development and run the risk of fogging. The tissue thus places in the hands of photographers a particularly easy and ready way of turning a paper print into a negative, or a dozen of them if necessary. They need simply to keep a few inches of the tissue by them, and at any moment are

in a position to secure a printing negative, so long as they have a print in their possession. But it is, as we have pointed out, a means which will prove essentially valuable for multiplying maps and sketches for military purposes. Where the question of reduction enters into the matter, we must, of course, still make use of the camera, but to reproduce a map as accurately as possible, with all its details, the tissue will come in very handy. A lens may not distort much, but still it cannot be perfect in its rendering, and in the case of a war map even the least distortion may at times be of importance, and for this reason reproduction direct by the film will be preferred to the other and older method. In the case of the last Franco-German war, we are told that when Gambetta came out of Paris in a balloon, and most of the French regular troops were shut in the capital or at Metz, the greatest difficulty he found with his new army was to supply it with information respecting the roads and bye-ways of the country. There were maps in plenty, and plates from which a further supply could be struck, but these were all locked up inside Paris. Fortunately, the widow of a general officer living at Tours had some copies of the ordnance maps, and from these Gambetta managed to secure copies by means of photo-lithography. But had, at the time, the emulsion film of which we are speaking been available, not only would it have been possible to secure copies more rapidly, but these, being printed by transmitted light from the original map, would have contained every detail without loss of a single point.

Photographs from the Seat of War.—We are glad to see that photographers are not altogether so apathetic on the subject of the war as we supposed. It seems that a Bucharest photographer has at last summoned courage to take a camera into Bulgaria, and was last heard of at the Russian head-quarters at Gorny Studen. It would not seem a very serious undertaking, after all, to take photographic apparatus into the field when provided with a Russian permit, for some of the views M. Duschek has taken tell of anything but hard campaigning. Indeed, the camp scenes we are shown suggest the reason of the Russian non-success. We see everywhere the space crowded with empty vehicles, not military waggons and ambulances, but of a nature used for transporting officers' luggage, and what might fairly be termed luxuries. According to many of the special correspondents, the superior officers drive from one part of the scene of operations to another, so that, so far as they are concerned, it is a campaign on wheels. This is borne out by M. Duschek's photographs, where carriages and horses are to be seen in large numbers, and especially in the vicinity of the headquarters. Bulgaria may not furnish very many delicacies, but whatever can be obtained appears to be forwarded to the Czar at his headquarters, where, we are told, waggons arrive daily from the Danube loaded with luxuries and good things for the Imperial. As a companion picture, we ought to have a photograph of the present Turkish Commander-in-Chief's headquarters, Suleiman Pascha, who sleeps, we are told, in a tent so small and low that he is obliged to creep into it on all fours. In lieu of purple flags and stately tents to mark the residence of his staff, this also finds accommodation under shelter of the same humble description. It would be well if we could have photographs of the two headquarters side by side; they would teach us a good deal, probably, of the character of the men now in chief command of the opposing armies.

POTASSIUM AND SILVER PERMANGANATES; THEIR PREPARATION AND PHOTOGRAPHIC UTILITY.

BY WM. HOWARD.

OCCUPYING a prominent position amongst the re-agents which have been pressed into the service of photography,

stands permanganate of potassium. This salt, which is the only one of its series manufactured largely, may be used as the source from which to derive its lesser known brethren, including the silver permanganate. The potassium permanganate can also be made to yield up its permanganic acid in the free state.

Although, having regard to the facility and cheapness with which this salt may be obtained in a pure state, it is neither desirable nor necessary to attempt its preparation when required for use in the laboratory or dark room, still a short *resumé* of the methods by which it can be produced may be of service to those who are but imperfectly acquainted with its chemical composition. The most simple statement of its component parts is this: the salt consists of potassium, manganese, and oxygen. A very small knowledge of the nomenclature of chemical compounds enables us to comprehend that there are compounds of these three elements which contain less oxygen than the permanganate. It is from one of these, not by any process of direct combination, that the latter salt is produced.

For instance, whenever potassium carbonate and black oxide of manganese (di-oxide) are strongly heated together, with free access of air; or, better, when with caustic potash, manganese di-oxide, and potassium chlorate—an oxygen giver—are so treated, the result is a greenish semi-fused mass, which contains *manganate of potassium*; and, in the last case, chloride of potassium also. This mass treated with a small quantity of cold water forms a deep green solution of the alkaline manganate which may be obtained in crystals of the same colour by evaporation over sulphuric acid in a vacuum. The symbol for the manganate is:— K_2MnO_4 ; that is to say, two equivalents of potassium are united to one of manganese and four of oxygen. The *permanganate* is written $KMnO_4$, one atom of potassium only entering into combination, the proportion of oxygen being therefore much greater than that existing in the manganate. If the green solution obtained as above described is heated, or even freely diluted with cold water, decomposition of the manganate at once takes place, and the result is the formation of potassium permanganate together with manganite of potassium, which immediately gives up its potash to the water, forming caustic potash, and depositing pure hydrated peroxide of manganese, thus:—



By evaporation, the permanganate is crystallised out on cooling, but is too well known to require description here. The most characteristic property of the permanganates is that they readily part with a large proportion of their oxygen to organic or other bodies having affinity for that element. It is to this readiness to effect at once the complete oxidation of decaying and offensive organic matter that the permanganates owe their power as disinfectants (Condy's fluid), and to this power is due also their usefulness in photographic operations.

The chief uses to which permanganate is usually applied by the photographer are:—1st. The intensification of carbon transparencies, or either carbon or silver negatives. 2nd. As an agent by means of which to remove organic impurities from the negative bath.

The employment of permanganate of potash as an intensifier, though not so important an application as the other, I have given precedence to, because it is more generally practised, and depends upon the oxidising power of that salt for its efficiency. Strictly speaking, it is not true that intensity is gained because the permanganate imparts oxygen to the material of the carbon picture, or to the film of the silver negative. This gain in intensity depends rather upon the fact that whenever permanganic acid, either free or combined with a base, parts with oxygen,

manganese dioxide is thrown down, a new acid being formed from the oxidised body. In the ordinary process of intensification with permanganate of potash, the manganese dioxide is deposited in the body of the transparency or negative, thus adding to its opacity; the new acid formed by the oxidation of the organic matter present, combining with the potash, forms a soluble salt.

The use of permanganate of potash for the removal of organic matter from the silver bath—printing or negative—which is *directly dependent* on the modification of that impurity through the acquisition of oxygen, deserves a more minute notice. Permit me on this subject to quote the words of a recent article in *Photographische Notizen*:—"The only trustworthy means of decomposing the organic substances in a bath—namely, by the use of permanganate of potash—is not yet sufficiently valued by photographers. And the reason for this is to be found in the circumstance that few operators understand how to employ the same properly." To the first of these propositions I can most cordially assent. The reason assigned is, I think, scarcely correct. The method of using permanganates for bath purification has been more than once described in our journals. The writer of the article quoted above, of which a translation appeared in this paper, very carefully particularizes the appearances which should guide the operator, but entirely omits the details of the changes which then take place. Herein, I believe, is discoverable the reason to which must be assigned the insufficient value often attached to permanganate as a bath renovator. The photographer of to-day, more educated than he of former years, demands that every reagent prepared for a specific purpose shall be furnished with proper credentials by which he may judge of its actual value, before he ventures upon its use.

I have recapitulated the general nature of the reaction between permanganic acid and an organic body; it remains now to exhibit clearly what secondary actions take place when a silver bath is subjected to such treatment.

As being the first object of a photographer's solicitude, the negative bath forms an apt subject from which to draw the requisite illustrations. The main organic impurities of a negative bath which has been in use are alcohol and ether. Boiling is both troublesome and expensive, and does not entirely expel the enemies; sunning requires a long exposure to the necessary influence, and is, like boiling, not altogether effectual. The effect produced by sunning, or more rapidly induced by boiling, a silver solution containing organic matter is, in its ultimate result, the exact parallel of that which immediately occurs upon the addition of a permanganate. The means by which the same end is attained are, however, very distinctly traceable to opposite sources. When a bath is boiled or sunned, the alcohol and ether which contaminate it are oxidised at the expense of the nitrate of silver contained therein. As I have in a preceding contribution remarked, this reaction is a very convenient one to take advantage of when it is desirable simply to destroy the comparatively small amount of organic matter present in ordinary water; but when the negative bath, or other working solution, requires to be freed from such impurities, it is not quite so satisfactory in its operations. Unless a very impracticably long exposure to light is permitted, the ultimate stage of oxidation—in the case of the negative bath the conversion of the alcohol and ether in acetic acid, and the consequent conversion of the silver oxide which at first forms into acetate of silver—is never reached; neither does boiling effect this complete conversion. Practically speaking, both sunning and boiling simply partially destroy the organic matter in silver solutions, giving a deposit of silver oxide, which is subsequently removed by filtration, and weakens the solution operated on in a degree exactly proportioned to its quantity. Permanganates, on the other hand, at once completely oxidise the alcoholic enemies into acetic acid, producing an equivalent quantity of the acetate of the base contained in the permanganate used, and as they

supply the oxygen necessary to bring about the transformation, no reduction or removal of nitrate of silver can occur. These two points—the completeness of the oxidation, and the non-abstraction of silver salt—are grounds sufficient upon which to advocate the employment of permanganates.

(To be continued.)

SPOTS ON EMULSION PLATES: THEIR CAUSE AND CURE.

BY W. BROOKS.*

Now that the emulsion process fairly ranks, with the landscape photographer, as one of the foremost processes of the day, I venture to bring it again before your notice. Some years since I said at one of the meetings of this Society that I thought the emulsion would take the place of the nitrate of silver bath. At the time this was doubted, but I have not had any reason to alter any opinion on the matter; for, during the past season, I have only used the bath once, and that was because I had not any emulsion then ready. Formerly I contented myself by working with a slow emulsion which was very certain. I am now using a very rapid one of my own make, and I can say, without the slightest hesitation, that it is more rapid than the ordinary bath plate, everything being in good, fair, working order, so that I am now quite independent of the bath, and see no reason why I should take to it again, especially for field work.

About the middle of the present year I had a large quantity of work on hand, and when I had to prepare the plates in large numbers I was troubled with spots. I had previously been quite free from them. Several had asked me if I had any spots, and my reply was always "no," until the time before stated. I was told that I was a lucky fellow. But my luck failed me at last, and then I set about to find the cause and the remedy, which I did, but not without a great deal of trouble and anxiety; and now that I am quite free from them I beg to offer the results of my investigations for the benefit of those so troubled.

In the last three issues of the *British Journal*, in articles by the Editors, there are several good suggestions as to the cause of a certain class of spot. In my experience I find three kinds of spots. No. 1 is a transparent spot, with a small black speck in the centre; this kind of spot altogether is not more than about one-eighth of an inch in diameter. No. 2 is a transparent spot also, but without a nucleus (or black spot in the centre), and has a ring of wave-like markings; this kind of spot is sometimes as much as half-an-inch in diameter or more—a regular patch. No. 3 is quite the opposite to the foregoing, being quite opaque throughout, the largest seldom being more than an eighth of an inch in diameter; this kind of spot is more uncommon than the two former.

I will deal with spot No. 1 first. I think there is not a question as to the cause of this kind of spot, and that is dust settling on the plate during the evaporation of the solvents ether and alcohol; and it is the kind of matter constituting this particle of dust that determines whether the resulting spot be transparent or opaque. Should that particle of dust be some inert substance, the result is only a pinhole; but should it be a retarding agent, such as a small particle of a bromide, iodide, or an acid substance, the essential part would be readily dissolved by both the ether and the alcohol, causing the parts round the substance so deposited to become insensitive to light, and originating the transparent spot, with the substance, whatever it may be, forming the nucleus. When the plate is nearly dry, before the dust falls on it, the resulting spot will be small, and perhaps not perfectly transparent throughout; but should any dust fall upon the plate when dry, no matter of what it is composed, it does not appear

to injure the plate in the slightest degree. When preparing only a few plates (about a dozen) I used a cupboard; but when I had to prepare larger quantities at a time I used a large box as well, and the plates set to dry in this large box were the ones that had the class of spot I designate No. 1, and they only occurred when I closed the lid. If I allowed the plates to dry without closing the lid they were free from that class of spot; hence I have no doubt they were caused by dust on the inside of the lid of the box becoming detached and falling on the surface of the plates in the moist condition on closing, the plates being in the box film outwards; and I think in nine cases out of ten many would use a box (and close the lid) for the purpose. I cannot agree with the writer of one of the articles in *The British Journal*, where he says that by dust falling into the emulsion, when poured out on the plate, it then, and only then, affects the film. My opinion is that anything falling into the emulsion—supposing it to be a restrainer or retarding agent—by virtue of the alcohol or ether the active principle would become dissolved, and be diffused throughout the whole of the compound, and would tend only to make it slower. On the other hand, supposing it to be a reducing agent, the small particles would be almost sure to be dissolved, and would do but very little harm (if any), and any substance that might be left behind would be of a sandy nature. To test this I have put all sorts of rubbish into the emulsion, and, after shaking it and letting it settle, have prepared plates that worked as well as ever.

I now come to the class of spot I call No. 2. This has a totally different origin altogether from the preceding one, and will also occur in the closed box before mentioned, especially if the solvents used be of a weak nature. I have seen the question frequently asked—"Why do spots occur in washed emulsion plates, and not with those prepared with an emulsion that has not been washed and dried and redissolved?" On a little consideration it is easily understood. The first named, known as washed emulsion, is poured over the plate and allowed to dry; that is, to allow the ether and alcohol to evaporate. Not so with the other kind. After the film has been washed and passed through the preservative and set to dry, only water has to evaporate. This kind of plate is generally free from spots; but, when using the washed emulsion, and the spirits have to evaporate, matters are changed. It is a well-known fact that strong alcohol has a great affinity for water, and, if the atmosphere be damp, water is attracted from it, causing the plates to dry patchy; and there is not only the affinity of alcohol for moisture to be contended with, but also the chloride of silver contained in the emulsion, as all chlorides absorb moisture. It will also be remembered that, in the days of the collodio-chloride emulsion, spots used to be troublesome. I know they were so with me, and that may be the cause why a chloride cannot be successfully worked in a gelatine emulsion. When the collodio-emulsion plates are dried in a damp or humid atmosphere they attract the water in patches; for, if plates are watched, the last parts that become dry are circular spots. These remain damp a long time, and that part of a plate that is a long time in drying seems to be the most insensitive. I had, to my regret, a batch of plates spoiled from having been prepared in a damp atmosphere in a butler's pantry just after it had been cleaned and washed up, and when there was no possible chance of dust. The last part of the spot to dry was, of course, the centre, and when the plates were developed the centre was the most transparent part. Some of these spots were quite half an inch in diameter. Of course, in this case, there was no nucleus.

The spot No. 3—the most uncommon—I suppose to be perhaps the dust of nitrate of silver or some alkaline agent. On the application of a dust of silver it makes its appearance as a black, opaque spot as soon as the ammonia is added to the developer; but, should it be an alkaline

* Read before the South London Photographic Society.

agent, a black spot appears as soon as the pyrogallie solution touches it, and that part of the film at once becomes reduced.

Having stated the cause of the 'spots' of the different classes as they have occurred in my practice, I will now point out the remedy. It is best to use neither boxes, drying-boxes, nor cupboards, and avoid damp atmospheres if possible. In my work I am now perfectly free from spots, and I proceed in this manner:—After the glass is cleaned I edge the plate, in the usual manner, with India-rubber, and a flat, stiff, hog's-hair brush is passed over the plate to remove any dust. I find the best kind of brush for this purpose is the flat hog's-hair varnish brush, such as is used to varnish oil paintings, very suitable. After I have coated two or three I dry them by means of a kind of hot-water bottle, which gives a very steady heat. If too hot when the water is first put in a thickness or two of cardboard is put over it, which is removed as the temperature gets lower. By keeping the spirits evaporating moderately rapid there is no chance of spots of the kind of No. 2; after being once dry they are perfectly safe. Keep away the dust, and spots Nos. 1 and 3 are out of the question. If the plates are made to dry by means of a current of air, that current of air will be sure to carry with it dust, and spoil the plate. I quite agree with Mr. Woodbury when he says that plates are best dried by means of heat.

In conclusion: I may say that an emulsion properly made is not so liable to get out of order as the nitrate bath. I have put all sorts of things in emulsion, by way of experiment, that would quite ruin the bath, and it has not injured the emulsion in the slightest. At one time I thought spots had a different origin to what I do now. Many say that if the emulsion be not allowed sufficient time to settle, spots occur. To try the effect, I have prepared plates directly I have shaken it up, and dried them off by heat, without any of the kind of spots above named. The only description of spot that can then make its appearance is a kind of sandy one. I trust what I have said may be the means of putting the emulsion process on a better footing; for I think there is nothing more provoking than to have what would have been a good negative ruined by a collection of spots.

KRUGER'S ARGENTOMETER.*

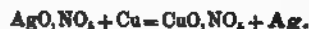
Herr JULIUS KRUGER has just constructed a new argentometer, to which we desire to call the attention of our readers. All the argentometers hitherto in vogue had particularly two defects: either they were in the highest degree untrustworthy, or they were most elaborate to use, except in the hands of scientific photographers. The so-called *scalens-argometer* gives in the case of freshly-prepared silver baths results of extraordinary accuracy; but this is not the case with impure solutions, such as are produced with the print bath; in the latter case other salts in solution are recorded as silver salts.

So far as the Vogel argentometer is concerned, this is beyond measure trustworthy; but it is hardly an instrument which everyone can use, and cannot, moreover, be carried about everywhere.

Herr Krüger has avoided these two drawbacks, and invented an argentometer which can easily be used, does not take up much space, and yields the most accurate results. By the aid of this instrument the photographer may in a very short time determine the percentage of nitrate of silver in his baths, reading the amount off upon a scale.

The principle upon which the invention is based is the following. Everybody knows that a strip of pure copper dipped into a solution of nitrate of silver becomes at once covered with a deposit of metallic silver, while a portion of the copper goes off into solution, as may be perceived from

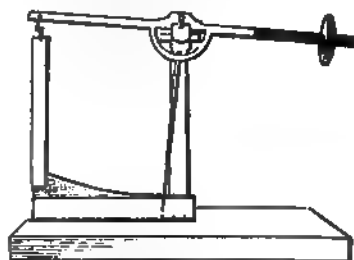
the circumstance of the solution turning blue. In this case, a substitution process goes on, an atom of copper taking the place of an atom of silver in solution; the process goes on until the solution of silver is exhausted, or until the copper is all dissolved. The operation is expressed in the following formula:—



Nitrate of silver = Nitrate of copper + silver + copper.

We find that 170 parts by weight of nitrate of silver go over to 31.7 parts of copper to form 93.7 parts of nitrate of copper, and 108 parts of silver; or, in other words: 31.7 parts of copper reduce 108 parts of metallic silver from 170 parts of the nitrate of that metal. From a given volume of silver bath all the silver may be thrown down in a metallic form, and from the loss of weight suffered by the copper (for the attached silver is easily removed) the percentage of silver in the bath may be easily calculated—the result being read off on a table constructed for the purpose. This is the principle upon which the Krüger argentometer rests.

The sketch given below will give some conception of the



instrument, which resembles, in fact, a decimal-balance. Upon a board is a stand upon which the balance stands. On the left is a strip of copper, while on the other side is a screw arrangement, which can be moved forwards or backwards to adjust the weight. It is easy to understand how the apparatus works.

If a photographer desires to find out the strength of his bath, he first of all adjusts the screw on the beam in such a way that the index rod points to 0; then a vessel belonging to the apparatus is filled with the liquid to be tested to the extent of ten cubic centimetres, and the measured quantity being afterwards poured into a beaker with some slightly acidified water, so that there may be plenty of liquid wherein to place the copper strip. This, after the balance has been accurately swung, is detached from the beam (the movable screw not being tampered with), and the copper placed in the beaker of diluted silver solution, the strip being from time to time moved about to quicken the precipitation of the silver.

The reduction of the nitrate of silver, or the substitution process, at once begins, and the copper strip proceeds to cover itself with a film of metallic silver, which, as we have already said, is easily removable. When the operation is deemed finished, the strip of copper is withdrawn, and the attached silver is removed with the aid of a piece of filter-paper, which should not, of course, be thrown away. If when the strip is again put into the beaker of solution the former remains unchanged, the reduction of the silver is complete; but if, on the contrary, the signs of reduction still go on, then the introduction of the copper strip must again take place, and so on till the solution is really exhausted. In the end there should be no change observable upon the surface of the copper, and this desideratum is soon attained.

When the copper is finally cleansed from the adhering silver, it is again hung upon the beam of the balance from which it was detached. It has become lighter since some of its mass has been dissolved, and the consequence is the index bar, instead of pointing to 0, goes off to the left, and the number on the scale at which it comes to rest indicates the percentage of silver in the solution which has been experimented with.

* Photographische Wochenblatt.

The objection that the free sulphuric acid in the silver bath would bring about a dissolution of the copper is as unfounded as the idea that the acetic acid which is added would bring about this result. In the first place, both acids are found in the silver bath in such a state of dilution that at an ordinary temperature, at any rate, they could have no material influence; and secondly, it must be borne in mind the copper remains in the solution but a very short time in any case. We have, we may mention, kept the copper strip for days in a fluid which consisted of two parts water, one part nitric acid, and one part acetic acid, and yet the finely constituted balance did not show any diminution of weight in the strip afterwards.

We hear that Herr Küger is patenting his instrument, and that it will speedily become an article of commerce.

RETICULATION AND BLISTERS.

BY D. T. BURRELL.*

THERE have been several articles written about reticulation in the carbon process, but I have seen none on blistering. I have reference to those about the size of a pin head and smaller.

As I have been troubled with both of the above for the past two weeks, and have fought my way through them successfully, I will give my experience for the benefit of others.

I studied up every article I could find on carbon, but none seemed to hit my case. One writer said that reticulation "can be produced or not produced absolutely at will;" but I soon found I could not rely on his statement, as they came about the same when the tissue was dried slowly as when quickly dried by artificial heat. I also tried different samples of collodion as well as different samples of tissue, and then without any collodion, and still they came, but not quite so much with thin as with thick collodion. I experimented with the sensitizing bath, and had been using a three per cent. solution with from twenty-five to thirty drops of ammonia. I substituted soda for ammonia with no better result. Determining to leave no stone unturned, I tried different temperatures of the sensitizing bath; also of the water before transferring as well as for developing. Drying slowly or quickly after developing the result was always the same—reticulation; and when a little over printed, a little extra developing would cause blisters. I inquired of those who had had many years' experience in carbon work, and they could not tell me how to get rid of them, but suggested that I should try a weaker sensitizing bath; by the way, I had reduced it one-half, but without the desired effect. I could not think it was too strong, for I had used the same for over seven months, making better work than I had ever done in silver, all my enlargements being made with it, both single and double transfer. I was beginning to feel discouraged (but no more than I had several times with the silver process). Now for one more trial with a weaker bath—one ounce of bichromate in ninety ounces of water; five drops of ammonia and three ounces of alcohol—and the result is that reticulation and blisters have all disappeared. Positives as well as transparencies are all that can be desired.

I have always been told that it would not do to use the sensitizing solution but once; that by using it over I could not get pure whites, &c. I have used the same solution for over two weeks, sensitizing every other day, and used over one band of tissue, floating about one and a half minutes and filtering each time. The prints came out all right; and to prove that they were all right, the last time I sensitized I made a new bath and tried a piece in the new and one in the old, and if I had not marked them I should not have been able to tell by the appearance of the prints

which was which. I have come to the conclusion that I have thrown away several pounds of bichromate by only using it once.

Instead of floating wax solutions on the developing plates, it saves much labour to use French chalk; also a rubber solution around the edges to hold the collodion, dries quicker than gum solution made with water, and holds better.

I have also found that dark or deep shadows can be removed with a tuft of cotton when the parts to be lightened are large, and the small spots or specks by the use of a soft pencil brush by stippling or drawing it lightly over the dark parts, while they are yet wet, with the warm developing water.

With soft or thin negatives[†] freshly sensitized tissue gives the best results; for intense negatives, or those with strong contrasts, the tissue should be sensitized three or four days. If there are any other workers in the carbon process who have met with the above difficulties, or any other trouble, I should be glad to hear from them, or exchange samples with them.

RETICULATION IN CARBON.

BY J. INGLIS.*

As reticulation seems to be the bane of carbon printing in hot weather, allow me to give you my cure, which has in my hands been perfect.

Instead of using the sensitizing solution of two and a half per cent., as stated, use only one and a half, and immerse until the tissue lies nice and flat, the temperature not being higher than 60°, and as much less as may be convenient. The quicker the drying, the better. If the weather is damp and a long time taken to dry the tissue, it will be very hard to develop, and the results will not be so clear and bold as if dried quickly. I find that I can keep it in first-class working order for four and five days in hot weather, and in cool weather over a week, easily. The water used before transferring the tissue must not be higher in temperature than 56°.

Before I used the cold water for transferring I was greatly troubled with the half-tones washing away and leaving hard print; since adopting the weak sensitizer and the cold water for transferring, I have not had the first signs of either of the above troubles. In developing on clean glass, it is very hard to judge when the prints are exactly light enough by looking through them against a white ground. A plan I have fallen on, which is much more certain, is to look through them against a shade or anything dark. I look for the high lights, and when they just begin to show clear glass (which is easily noticed by holding them opposite anything dark), I stop the development.

Another useful dodge is to use a solution of bicarbonate of soda in very hot water, to reduce an over-printed picture. I develop four cabinets on one plate; and, supposing one of them is printed too dark by one-half (which would make it perfectly useless were it an albumen print), I hold the plate opposite the dark shade and pour from a graduate glass or small pitcher a strong and hot solution of bicarbonate of soda on it, which will bring it into the same state as the other three in very short time. By using the soda the reduction is even and soft; the print loses nothing in detail as it would with ammonia.

Instead of using waxing solution for my glass, I use "French chalk"[†] or soap stone. By using this the pictures never leave the glass until you help them, when they will come off perfect.

Clean the glass with alcohol one ounce, nitric acid five drops, before powdering them with the chalk, which I do with a tuft of cotton.

* *Anthony's Photographic Bulletin.*

† It is as well to note that we think the wax solution better from the fact that the French chalk always leaves a haziness or fog, which detracts very much from the beauty and brilliancy of the results.—Ed. A. P. B.

* *Anthony's Photographic Bulletin.*

The Photographic News.

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THE PHOTOGRAPHIC EXHIBITION.

THE exhibition which was opened on Tuesday evening promises to be a success. A general impression had prevailed for some time previous to the opening that it would be a good exhibition. The bitterness arising from the agitation which bid fair to destroy the Society a few years ago appears to have been dying away, and a spirit of co-operation and unity again springing up. And the result is, we think, shown in the exhibition. In numbers alone this year the exhibition is unusually satisfactory, the number of contributions catalogued being five hundred and sixty-five as against three hundred and fifty-two last year. And there are upwards of two hundred pictures rejected, we understand, not for want of excellence, but want of space. In the matter of quality we think the exhibition is, on the whole, a still greater advance. There is a very high average of good work, and there is some superb work. There is, moreover, great variety of style and effect. Technical excellence seems in this day to be taken for granted as a matter of course; but we have much very exceptional technical excellence, and also a very gratifying display of pictorial qualities. The general effect of the hanging is very satisfactory; whether it may be found so throughout in detail is probably doubtful. The task of an amateur hanging committee is an arduous and a thankless one, involving much sacrifice of time, a good deal of actual labour and worry, and generally issuing, if not in failure, at least in much discontent. The duty of hanging the pictures in an exhibition requires for its successful carrying out much experience, much patience, and plenty of time, besides fine taste, good judgment, and a strictly impartial mind; and it is almost hopeless to expect all these conditions combined in a scratch hanging committee generally impressed into the work because the gentlemen forming it are sufficiently amiable to devote the time and accept the responsibility, despite its thankless character.

Prominent amongst the exhibitors whose work has been sadly missed at the last three or four exhibitions, returned this year, is Mr. H. P. Robinson. And he has made his return worth note by the contribution of one of the finest works of art of the many he has produced. In the place of honour, in the centre of the wall opposite the door, is hung the picture to which we referred some months ago as in preparation by Mr. Robinson for this exhibition, entitled "After the day's work is done." The picture is of large size, and represents a cottage interior lit by a small lattice window, through which a delicious glimpse of distant landscape is obtained. Seated at a table is an aged peasant with a large book before him—presumably a bible. The extended forefinger of the fine old man, tracing the line as he reads, suggests that some little effort is called into exercise in reading, and the eye must be assisted to

grip the line by the tracing of the finger, the whole aspect of the reader suggesting that he is not engaged on a facile task. On the other side of the table, and manifestly listening to the uttered words of the reader, is an old lady, clearly his wife, and both wear the calm and comforted aspect which the sacred words induce. A grand solidity and massiveness of light and shade characterise the picture, shadow largely prevailing, as, in a cottage interior at eventide, it must inevitably do. But there are no black opaque shadows. The deepest shade is rendered luminous and transparent by reflected light carrying detail into the darkest gloom. We noted that a crowd was generally gathered round this picture, and that the most eager amongst its admirers were invariably the men of the highest culture and art capacity amongst photographers. Specific pictorial attempts are not numerous in this exhibition, but there are some very fine pictures. Mr. Slingsby, of Lincoln, as usual, contributes something well worth looking at. His picture is entitled "Alone," and accompanied by a couplet descriptive of the scene—

"The tiny wavelets ripple to the shore,
And hush the tale of days that are no more."

A graceful female figure is seated by the sea shore in musing loneliness. The light draperies are treated with great skill and tenderness, and the sea rippling towards her feet: the sky and general landscape effect are simply delicious. A perfect sense of calm prevails, and the picture is full of daylight. It is full of atmosphere and space also, and that without any grey mists hanging about. The sense of space is perfect, and the looker-on feels that he could walk round the figure. In every detail the picture is a noble one. Mr. Faulkner sends several frames of the charming pictures in the production of which he is *facile princeps*. The almost infinite variety of infantine beauty he gives in his frames of small pictures requires much time to appreciate, and never wearies. But the great pictorial charm is in his carbon enlargements on porcelain with artistic finish. These, in many respects, are the gems of the exhibition. One of the most charming of these is a severe test to the spirit of charity and tolerance with which we have resolved to regard the labours of the hanging committee. We can see, partially, how exquisitely delicate and beautiful the picture is; but it is hung so high that it is impossible to examine its detailed perfections without the aid of a step-ladder, or opera glass. As we cannot readily avail ourselves of the first, we shall on another occasion try the aid of the second. A similar oversight in hanging is found in the microscopic enlargements exhibited by Mr. Viles. These are of unusual size, and, apparently, very fine; but the especial point of interest in such enlargements—perfection of definition—cannot possibly be examined, hung as they are far above the eye-line. One more case came under our attention. A subject picture, in carbon, by Mr. Higginson, entitled "La Somnambula," is a poetic picture of very low tone 'and great delicacy; but it is so far above the eye that it not only escapes attention, but cannot be examined with care. Mr. Higginson is doubly unfortunate. A couple of pretty figure studies of girls, entitled "Spring" and "Autumn," are numbered on the frame "49." Turning to No. 49 in the catalogue, we find it given as "Sheire Church," by Lieut. L. Darwin. Mr. Higginson's title and name being nowhere to be found. This is due to the haste with which the catalogue is inevitably prepared, and will, doubtless, be corrected in a second edition. We may note here, in reference to these two studies by Mr. Higginson, that they are not only very fine studies, but are good examples of combination printing in carbon, each having been produced from three negatives. We may remark, in passing, that carbon, although not very extensively represented, is in all cases most excellent. Amongst the noteworthy pictures which excite attention are some exceedingly charming landscapes by Mr. Crawshaw, and some fine groups by the same gentleman. His

photograph of Brecon is one of the finest landscape views in the exhibition. Mr. Blanchard has some fine portraits and single figure studies. A study of a Greek girl, entitled "Keolanthé," is exceedingly charming. Col. Stuart Wortley has some fine studies of clouds and sea, seriously marred, we regret, in more than one instance, by curious errors in the combining of two negatives in one print; in one case the sun, and the stream of reflected light from it on the water, not being in one line. A pleasant feature of this exhibition is a fair proportion of contributions from foreigners, and generally of very high quality. Herr Taeschler sends some very fine figure studies, illustrating his method of modifying the background by touching on the back of the negative. Herr Bernard Mischewski sends some exceedingly fine large heads, described as taken direct by Dallmeyer's 6A lens in a marvellously short time. Mr. G. Nesbitt has some very artistic and technically perfect figure studies. Mr. Ford Smith has some good subjects produced by combination printing. Mr. J. M. Young, of Llandudno, has also some very fine studies. Mr. S. Fry exhibits some figure studies, of which 335, "The Taxidermist," is very good. The arctic photographs exhibited by the London Stereoscopic Company are exceedingly interesting. Mr. Warnerke's contributions illustrating the use of his tissue will be found exceedingly interesting. There are many fine studies of animals to which we must refer in detail in future. M. Klary, of Algiers, exhibits examples of his mode of lighting which will interest many. We cannot here, in a general view of the gallery, even barely name a tithe of the contributions worthy of notice, as we briefly indicate only some of the contributions which arrested our especial attention on a first visit.

It should be noted, however, that the opening soiree was exceedingly well attended by an animated and interested company of ladies and gentlemen, the occasion, as well as the exhibition, being apparently eminently successful. We shall commence some notes on the pictures in detail in our next. The medals will be, we believe, announced at the November meeting of the Society.

FRENCH CORRESPONDENCE.

FOX TALBOT: HIS GENIALITY & CHARACTER—DRAPER'S DISCOVERY OF OXYGEN IN THE SUN—LIESEGANG'S PHOTOGRAPHIC MANUAL—CAPTAIN WATERHOUSE AND PHOTO-ENGRAVING—BOIVIN'S DRY PLATE METHOD: MODE OF PREPARING HIS PLATES—BOIVIN'S ALBUMEN PROCESS.

ALLOW me to add one word of regretful remembrance to the obituary notice devoted in your last to the memory of Mr. Fox Talbot. I had the honour of meeting him frequently some time ago, and when he visited Paris he did not fail to give me a friendly call. He had always much to tell me, and I learnt a great deal from him. Perhaps the friendly interest which he felt in me arose from my championship of his rights in France, where I upheld his claims always. A medallion on the frontispiece of the *Moniteur* shows him in combination with Niepce and Daguerre, and from my having designed this, which has been copied into almost every book on photography that has appeared in this country, he may have felt himself in some degree beholden to me. Whatever there was between us, I appreciated to the full the goodwill of the illustrious inventor, and that spirit of justice which pervades all who have made great discoveries. Mr. Fox Talbot in his relations with me always appeared filled with modesty, sincere, and characterized with gentleness, at a time, too, when, from the opposition and ingratitude he experienced, one might well have expected some degree of irritation. I am very happy indeed to be able to render this testimony to his memory.

The *Compte Rendus* of the Academy of Sciences which has appeared this week, and which contains the communications made on the first of October, embraces a memoir

of Mr. H. Draper upon his beautiful discovery of oxygen in the sun, and upon the new theory of the solar spectrum of which it is the result. A photograph of a very interesting nature accompanies the work, and it is, I believe, the first time that photography has served to illustrate this branch of science. The image of which I speak shows in its upper portion the spectrum of the sun, while the lower part is that of the spectrum of oxygen and nitrogen in the air. The photograph, as may be supposed, has not been retouched in the least, and the oxygen, iron, and aluminium are perfectly distinct. The print has been produced by the Albortype process from a negative of Mr. Draper's. The same was secured with a wet collodion plate which was so constituted as to support a fifteen minutes' exposure without losing any of its sensitive qualities.

Dr. Liesegang is about to publish in the French language a work of an eminently practical nature, and which cannot fail to be thoroughly welcome. We have already had an opportunity of seeing the proofs of the volume, and among them we found one article especially excellent, upon obtaining brilliant clichés by a wet collodion process. It constitutes in itself a veritable treatise of practical photography. One chapter upon collodion emulsion, and another upon gelatine emulsion, find a place in the volume, and they are both very interesting, while a very good chapter upon albumenized paper is also there. Nor is carbon photography forgotten, for we have a number of observations on the subject. Woodcuts in plenty accompany the text, and augment still more the clearness of the operations described by an experienced author whose name has been known for a long time by his works.

Captain Waterhouse, attached, as my readers know, to the Surveyor-General's Department at Calcutta, writes me that he has recently made some experiments with a process of photo-gravure based upon that published by M. Geymet. Although his results have been satisfactory, Captain Waterhouse thinks it advisable to wait awhile till the process is complete in all its details; we may therefore shortly expect an interesting and valuable communication from this officer.

In a letter which he has just sent to me, M. Boivin enters into a description of a dry process which yields plates quite as sensitive in their way as those prepared by the wet method. I have seen prints obtained by the aid of this very simple method, and I must declare that they appeared to me in every way excellent. The plates, covered with a preliminary coating of albumen, are collodionized in the ordinary way, and sensitized in a bath composed as follows:—

Water	...	100 cubic centimetres
Nitrate of silver	...	8 grammes
Acetate of lead	...	1 gramme
Acetic acid	...	a few drops

They are immersed without washing in a solution of chloride of sodium (1 gramme dissolved in 1,000 of water) to which has been added 1 decigramme of gallic acid. The plates are then washed in pure water and allowed to dry. In this way there is formed chloride of silver, which acts as a preservative, and some traces of gallate of silver, which adds to the sensitiveness of the film. Prepared in this way, the plates may be said to be capable of being preserved for an indefinite period without losing a trace of their sensitiveness, if only the operations are conducted with the necessary care. The time required for exposure is the same as that necessary for a wet plate. It varies, as a matter of course, with the lens employed, the opening of the diaphragm, the intensity of the light, and the nature of the subject. But, as with all dry processes, it is well to prolong the exposure, and this can be done exceedingly well with the plates, since they have no tendency to become solarised by over-exposure. I repeat that the results I have seen leave nothing to be desired.

A propos of M. Boivin, I may mention that many photo-

graphers have recently written urging me to call attention to that gentleman's albumen process, which he published two years ago, and which I reproduced in the columns of the PHOTOGRAPHIC NEWS. My correspondents tell me that the process is so very simple by reason of the circumstance that most of the operations may be conducted in full daylight.

ERNEST LACAN.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

As regards the kind and number of prisms to be employed, there are various opinions on the subject. The object for which the spectroscopic work is required must be taken into consideration. If, for instance, it be desired to determine the limits of sensitiveness to the spectrum of any particular compound, it will be found that one large prism is preferable to a larger number of small ones; and again, it is not so absolutely essential in this case the prisms should be "above suspicion" as regards the perfection of their surfaces, since any small error would not appreciably affect the result. It must not be supposed that a prism of any description, such as that from a gaselier, will answer. There are limits beyond which imperfections will give inaccurate results; but the inference which I wish to be drawn is this, that if a prism have fairly worked surfaces, then for the purpose of testing the sensitiveness of different compounds a very exact defining power is not an absolute necessity. Thus, I have found that the hollow bottle prisms filled with carbon disulphide, such as are supplied by dealers for class experiments with the electric light, are quite good enough to employ, at all events, in preliminary examination. It may be asked, Why, then, have such a perfect collimator as has been described? The answer to this is, that a good collimator costs but very little more than a rougher one, and it can be used for the most delicate experiments, and it is always well to have a slit the opening of which can be ascertained with accuracy, since with even a rough prism, most important results may be obtained as to the sensitiveness of compounds with differing intensities of different coloured rays.

It would be better, on the score of economy, that the experimenter should provide himself with a really fine prism at first, since it is almost certain that after a few experiments with the rougher one his ambition will be raised, and he may wish to use it for photographing metallic spectra, or for noting absorption bands and lines. A dense glass prism of some two and a-half inches wide and one and a-half inches high, having an angle at the apex of the polished surface varying between 60° and $62\frac{1}{2}^\circ$, will answer almost any purpose. Some opticians supply these prisms with the top bases and backs merely ground to give a dull appearance. With such (particularly if it have the larger angle as given above) the operator should beware, as there is often false light introduced into the spectrum by reflections. The remedy is simple: give them a good coating of dead lamp-black on the ground surfaces. Unless a diffraction grating be used for obtaining spectra, there is always a certain amount of light diffused through the body of the glass itself, owing to glass being a turbid medium (though for ordinary practical purposes it is perfectly transparent), and in some experiments which I undertook it had a disastrous effect. This, however, cannot be got rid of, except by carefully studying the necessities of each case, and cutting off any particular ray which might prove annoying. I may particularly remark that if it be desired that as much light as possible should fall on the plate, the apex of the prism need only have an angle of 40° to 45° , since the reflection from the surface is diminished as the angle with the normal to it is diminished. To mount the prisms, procure a perfectly flat slab, ground with great precision and of the necessary dimensions, so that it is a practically plane plate. Then raise it on a stand resting

on a tripod, so that when the prism is placed upon it the centre of the prism is of the same height as the centre of the collimating lens.

The table on which the collimator, prisms, and camera are placed should be perfectly steady, and, if possible should rest on the ground and not on a boarded floor since the vibrations of the latter caused by footsteps, &c., are apt to be communicated to the table and thence to the apparatus. If it is merely the sensitiveness of compounds that is being studied, this is not of so much consequence; but in studies of this description too much care can never be taken, however rough they may be, for we all know the old proverb about the formation of habits.

We next have to consider the lens that should be used. One point is essential: it must be of at least equal diameter with the height of the prism, otherwise a portion of the beam of light may pass outside it, or strike on the mounting and lead to reflections, which may prove very bothering. As to the focal length of the lens, that, again, must depend on the nature of the work undertaken; if it be required simply to ascertain the sensitiveness of compounds, it may be much shorter than if used for mapping the solar spectrum. I do not advise, under any circumstances, a less focal length than ten inches, as below that with one prism (with which you can get the brightest possible spectrum), the length of the spectrum impressed on the plate would be too small to be satisfactory. Calculation will show that if you gain the same length of spectrum by using two prisms with a lens of five inches focus, as you do by using one prism with ten-inch focus, that the brightness of the light is superior in the latter case.

It also must not be lost sight of that the violet end of the spectrum loses its intensity by passing through a series of prisms more rapidly than over the red end, since the angles, measured from the normal, at which the former rays strike the surfaces of the prisms, are always greater than of the latter rays, and therefore more of them are reflected. For the determination of lines, &c., a lens of focal length of from four to six feet is desirable. It is by no means necessary that the lens should be achromatic, though what has been said regarding the collimating lens applies in this instance. A few shillings should purchase a non-achromatic lens which is suitable, and two or three more may be spent on the mounting of it.

Part of the camera may be manufactured at home if thought advisable. It should be of about whole-plate size, so that a plate eight and a half inches in width may be used; the dark slide should have an inner frame to carry a plate (say) eight inches by two. The necessary length can be secured by making a light wooden frame of such dimensions as just to fit against the camera. When a rigid front board is fastened at the end to carry the lens, the frame is covered with two thicknesses of brown paper, and a good coating of lampblack given to the inside, and this part is complete, except so far as attachment to the camera is concerned. It is a good plan to carry the framework and the camera on a flat board, and fasten them both down to it, leaving, of course, the focussing screw free to work.

It will be apparent that the camera must be of that kind which focusses from the back. It is very desirable also that there should be a horizontal swing back to it, since a better general focus can be obtained by using it.

THE PRODUCTION OF PYROXILINE FOR PHOTOGRAPHIC AND MEDICAL PURPOSES.

BY W. GODEFFROY.*

AMONG the numerous receipts for the production of pyroxiline the following holds as one of the best:—

Saltpetre	...	...	560 grammes
English sulphuric acid	...	420	"
Fuming	...	420	"
Cotton wool, oil freed...	...	70	"

* Continued from page 484.

* Zeitschrift Allgemein Osterr. Apoth. Ver eins.

I have repeatedly employed these proportions, and have obtained, as result, a pyroxiline that for the most part dissolved in the ether; the solution was, nevertheless, cloudy, and always showed small particles of undissolved wool floating in it, rendering the collodion useless for photography, and only applicable to medical purposes after long standing and waiting. I sought for the cause of this unsatisfactory result in the saltpetre used, fearing the latter might be in too damp a state; I dried the same, therefore, in a large mortar, and, when cold, employed it again, but with no better success.

One day, requiring some collodion in a great hurry, I neglected to take the mortar, together with its contents, from out the sand-bath, and after having added the acids, I simply placed the oil-freed cotton wool in the mixture. This time I obtained a pyroxiline which dissolved in the ether completely without residue. My idea as to warming of the mortar, together with the mixture, to a certain degree, being necessary for a favourable result, was consequently borne out, and I obtained thenceforward a wool that always dissolved completely in the ether, taking the precaution at the same time to leave out the fuming sulphuric acid, and to replace it with English acid.

The temperature at which this experiment was conducted, with the saltpetre in the mortar, was 56° Cent., and the action of the acids on the wool lasted seven minutes. The component parts were proved to exist in proportions as follows:—

Cotton wool	35 grammes
English sulphuric acid ...	700 "
Saltpetre	350 "

The freeing of the cotton-wool from oil is done in the regular way, by warming in a solution of soda, and a short boiling in water to which a small quantity of caustic potash has been added; lastly, it is thoroughly washed out in distilled water.

The cotton thus prepared is dried and well picked out, and then placed with the above-mentioned proportions in the mortar. It is stirred well with the pestle, so that it comes thoroughly into contact with the acids, and is allowed to remain immersed for seven minutes; afterwards it is quickly removed into a large vessel of hot water, and then placed under a stream of cold water till every trace of the acid has disappeared. Finally, it is washed several times in distilled water.

This compressed pyroxiline should be then picked out, and at once dissolved or covered with damp sand.

ON THE PRESENCE OF HYPOSULPHITE OF SODA IN MOUNTING BOARDS.

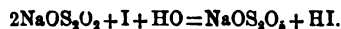
BY DR. H. VOGEL.*

RECENTLY instances have repeatedly occurred of the presence of hyposulphite of soda in cardboard, and the subject has therefore appeared to me sufficiently important to warrant investigation. Both from North and South Germany specimens of doubtful cardboard were forwarded to me, upon which pictures had in time become yellow under circumstances which seemed to preclude the idea that the defects could be traced to any other source.

The samples of cardboard to be examined were cut into pieces, and placed in lukewarm distilled water for the space of twelve or twenty-four hours, and the resulting liquid then tasted with iodine starch. To prepare this latter material one gramme of iodine was dissolved in twenty-five grammes of alcohol, and this was diluted with 625 cubic centimetres of water. A solution of starch was then prepared by boiling one gramme of powdered starch in 100 grammes of water, and 25 cubic centimetres of this was mixed with one cubic centimetre of the diluted iodine solution. In one cubic centimetre of this blue starch solution

there was $\frac{1}{15625}$ of a gramme of iodine, and the admixture of it with water in which the card had been steeped brings about a gradual bleaching of the tinted starch.

In order to make a reliable experiment, two perfectly clean test tubes should be taken, and having been placed close together, one cubic centimetre of the iodine starch is placed into each; to the one is then added fifteen cubic centimetres of pure distilled water, and to the other the same amount of water in which card has been steeped. By shaking and comparing the tints of the two fluids, it is evident whether or not a bleaching of one of the liquids has taken place; any bleaching action being due to the oxidation of hyposulphite of soda. The following equation will demonstrate this:—



Two equivalents of hyposulphite of soda, therefore, absorb one equivalent of iodine. The atomic weights of crystallized hyposulphite and iodine are nearly equal, the former being 124, and the latter 127, and one part by weight of iodine will therefore neutralize two parts of the soda salt; it is easy, therefore, to calculate the amount of hyposulphite in any cardboard under examination.

For instance, I steeped three carte-de-visite cards in 100 cubic centimetres of water, and of this I required 14½ cubic centimetres to bleach one cubic centimetre of the iodine starch of the strength above referred to. It follows, therefore, that 100 cubic centimetres of the water sufficed to bleach seven cubic centimetres of the starch. The latter contains $\frac{1}{127}$ of a gramme of iodine, which will neutralize $\frac{1}{127}$ of a gramme of soda, and therefore one carte-de-visite card contained about $\frac{1}{15625}$ or $\frac{1}{125}$ of a gramme of hyposulphite of soda.

Manufacturers may deem such quantity to be very little possibly, but that this amount is of influence it is easy to prove. A sheet when attached to a silver print contains on an average 0.075 or $\frac{3}{4000}$ gramme of silver, and a carte-de-visite or $\frac{1}{36}$ of a sheet $\frac{3}{4000} = \frac{1}{480}$. Therefore the carte-de-visite contains 6.6 times as much silver as the card does hyposulphite of soda. Now 31 parts of hyposulphite are sufficient to act upon 27 parts of silver, and convert them into sulphide of silver, and therefore we find that the amount of soda in the carte-de-visite is enough to convert one-eighth of the silver into sulphide of silver. And as, moreover, the silver is very unevenly spread over the surface of a picture, the high lights containing much less than the shadows, the amount of soda above mentioned is quite sufficient to bring about a change of the silver in the high lights or whites of the picture.

Photographers who desire to make an experiment such as here recorded, must be enjoined to undertake it with the greatest care. All vessels and test tubes employed, as also one's hands, must be scrupulously clean. Those who conduct such experiments after performing fixing operations, and carry about with them traces of soda, may be led into making very grave mistakes.

The testing fluid must always be employed quite fresh. One gramme of iodine is dissolved in 25 cub. cents. of alcohol, and 2½ cub. cents. of this solution is diluted with 900 cub. cents. of pure distilled water, and 100 cub. cents. of starch solution is added. This liquid then contains precisely $\frac{1}{15625}$ gramme of iodine. The experimenter should then proceed as in the manner I have indicated.

It is a question whether cardboard which has been proved to contain hyposulphite can be rendered serviceable. I believe it can. It is only necessary to treat the card with some substance which will decompose the hyposulphite without injuring the picture, and such a substance is iodine.

The illustration I have given above shows that 7 cub. cents. of iodine solution 1:15625 was required to decompose the soda in three cartes-de-visite. It is only necessary, therefore, to moisten the cardboard with about double as strong a solution of iodine solution in order to render

* *Photographische Mittheilungen.*

the hyposulphite altogether innocuous. Dipping in iodine water would be quite as effectual. The small quantity of superfluous iodine would rapidly evaporate on the drying of the cardboard.

Admixture of iodine to the starch or paste employed in mounting the photograph might answer the purpose equally well of neutralising the action of any hyposulphite contained in the mounting board. I cannot, however, yet say whether such a proceeding would be advisable until I have made a few experiments on the subject.

Correspondence.

RETICULATION IN CARBON.

DEAR SIR,—My experience has been so decidedly different from Mr. Witcomb's that I should like to lay it before the chromotyping fraternity, that we may discover the reason. First, then, like Mr. W., my satisfaction with chromotypes increases: also the public's, as is evidenced by my daily increase of that work, at an advance in price of 25 per cent. over the silver. There is little danger of over printing, as, with bicarbonate of soda and hot water, a very dark print can be reduced without any loss in half-tone.

Reticulation—on this side of the water, at least—is very troublesome to many yet, and has been especially to myself until lately. The way to steer clear of it is directly opposite from that of Mr. W.'s. I am now using a sensitive solution of one ounce bro. potas. to ditto of water, to my best satisfaction. Since using a weak sensitive solution I haven't seen reticulation. Of one thing I am positive, that quick drying won't produce it in my sensitive solution. When I used one ounce b.c. potas. to thirty water in summer, I had continual reticulation. I can use the tissue to first-class advantage, four and five days after sensitising in hot weather, but could not when using the strong solution.

I find the morning the best time to begin developing the previous day's work. I use a vertical trough, and when the paper is stripped I put the prints into water at from 84° to 86°, when I can go about and attend to any other kind of work, and return to give the final rinse to the prints in half-an-hour, or, if need be, in two or three hours, as convenience allows; in either case they are always ready, and no danger of the half-tones being washed off. Though more time is taken to develop in this way, yet there is less time consumed, as the developing goes on itself, and to much better advantage.

I must say my experience in the washing up of the high lights and loss of detail have only been when I was using a three per cent. sensitising solution, and not since adopting the weak one, as Mr. W. says is the bether of the photographers in carbon printing.

I have no doubt but our Canadian climate may have something to do with these discrepancies, but where is the difference, if the ends attained are alike? And to be satisfied on that point, I hope Mr. W. will send me a sample for exchange; and also any other successful chromotype worker, as I think an exchange of prints might be equal to an exchange of ideas. The one would at least help the other. So some of you try it.

Montreal, September 28th.

J. INGLIS.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 4th instant, the Rev. F. F. STATMAN, M.A., F.G.S., &c., presiding.

The minutes of the previous and out-door meeting having been read, Mr. Houghton and Mr. Malony were elected as members.

Mr. Brooks read a paper on "Spots on Emulsion Plates; Their Cause and Cure" (see page 483).

In course of a desultory conversation on emulsions, Mr. Brooks, in reply to a question, said that at present he would rather not publish the details of the emulsion process he employed. He preferred to dry his plates by means of a hot water bath which he exhibited. A vote of thanks was awarded him for his paper.

The SECRETARY intimated that the Annual Technical Exhibition of the Society would be held on November 15th; the ordinary monthly meeting to take place on the 1st.

There being no other business, the proceedings terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE first ordinary meeting of the season was held in 5, St. Andrew Square, on the evening of Wednesday, the 3rd inst., the President (Mr. LEASDALE) in the chair, when the minutes of previous ordinary and out-door meetings were read and approved; and Messrs. T. W. Drinkwater and John Todd were admitted ordinary members.

Dr. HURTER exhibited a large collection of water-colour and other sketches of scenery in the Highlands of Scotland and North of Ireland (with a view, in the first place, to offer suggestions to photographers), of localities rich in the picturesque, and also to seek information as to the best means of getting them reproduced by photography, and how best to finish them for that purpose. The exhibition elicited a good deal of discussion, the outcome of which was, that the sketches should be finished in monochrome, with Indian ink warmed up a little with brown, or in grey; and that such of the mechanical processes for printing in carbon as was found most suitable in the relation to the number of copies required, be selected.

Mr. W. T. BASHFORD then read a paper entitled "Odds and Ends," which turned out to be a review of the work of the Society during the past four years, and in which he found fault with much that had been done, both as regards the work itself and the manner in which it had been accomplished. He also expressed a wish that the business of the ordinary meetings should take a more practical form, and that, for the benefit of younger members, such elementary proceedings as the coating of a plate with an albumen substratum should be shown and illustrated.

Dr. THOMSON said that Mr. Bashford was generally so practical in his observations, and had frequently such interesting information to give, that he had come to the meeting on purpose to hear him; and, while he did not agree with all that he had just heard, he had listened to the paper with much pleasure, as it contained some valuable suggestions. But, as he had not had time to digest the subject, he could not at present say more on it.

Mr. DONNIX agreed with all that Mr. Bashford had said. He knew, from his long experience, that he would have something to say that was worth listening to, and had come to the meeting on purpose to hear it. Although the Society numbered over three hundred, the business was mainly conducted by about a dozen. So long as the Society agreed with them all went well, but when it did not do so things were not so pleasant. He believed that, although the influence of the popular meetings was of a transitory nature, they had added much to the membership of the Society, and thought that the practical papers suggested by Mr. Bashford would do much good.

Mr. MACGIBIN thought that if instead of always having regular papers, which often serve no practical end, each member would from time to time bring specimens of his work, it would give rise to discussions of much value, and elicit much useful information.

The business then took a conversational turn, the subject being the relative advantages of collodion and gelatine emulsions for the preparation of dry plates.

The PRESIDENT stated that he had recently tried those prepared by Messrs. Gray and Truett with the gelatine emulsion introduced by Mr. Gray, and found them better than anything he had yet used. They were quite equal to wet collodion in rapidity, and developed into clean, beautiful negatives.

Dr. THOMSON had recently seen a lot of portrait negatives, both on collodion and gelatine films, and had no difficulty in picking out the best, and they were all gelatine.

Votes of thanks were given to Dr. Hunter and Mr. Bashford, and the meeting adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management held their monthly meeting at 174, Fleet Street, on Thursday, October 4th.

The minutes of previous meeting having been read and confirmed, the subject of removal of office was then considered, and, after some discussion, the following resolution was passed:—"That the Secretary be authorized to give due notice of removal of the Society's business from 174, Fleet Street, and that he engage the room at 160A, Aldersgate Street, E.C., as the Society's office, upon the terms placed before the Board." At which place the Board of Management will meet on the first Wednesday in every month, at 8 p.m., instead of Thursday, as previously. Members are requested to note the removal in their rule books, &c.

The meeting then adjourned till Wednesday, November 7th.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of this Society was held as usual at the Museum, Queen's Road, Bristol, on Wednesday, 8th instant, Mr. BALGHTMAN in the chair.

The SECRETARY having read the minutes, which were confirmed, Mr. Redcliff, of London, was elected an ordinary member.

The SECRETARY then read the report for the past year.

"Your Council, in presenting the report for the past year, desires to congratulate you on the steady increase in the number of members, there having only been one indoor meeting at which one or more has not been elected.

"The following papers have been contributed by members, to whom the Association is greatly indebted, and tenders its best thanks:—"Intensification of Wet Plates with Iron," by Mr. E. Britman; "Light, Exposure, and Development," by H. A. H. Daniel; "Note on Photographic Chemicals—Their Adulteration," by W. W. Stoddart; "The Waxed Paper Process," by P. J. Worsley; "The Collodio-Albamen Process," by Dr. G. H. Thompson.

"The thanks of the Association are also due to the Committee of the Bristol Museum, for placing a room at its disposal on advantageous terms.

"The financial position of the Association is satisfactory, the balance of income and expenditure having been adjusted to within a few shillings.

"The monthly evening meetings have been fairly attended, although, looking at the attractiveness of the papers read, and subjects provided for discussion, there is room for improvement.

"Your Council regrets that the three outdoor meetings have been so poorly attended, especially as it was generally expected they would prove, if anything, the most popular. Your Council strongly urges and hopes that every member will do his best to at once resolve that few, if any, of the evenings announced on his cards for next session shall be engaged to the exclusion of the Association's meetings; it also hopes that the outdoor excursions will prove the popular meetings of the future, and that they will be attended by a larger number of working members. In conclusion, the Council urges the desirability of each, individually, doing his utmost to increase and popularize the Association."

LEUT. LYSAGHT moved the adoption of the report, which was seconded by Mr. BOYDEN.

The accounts, which had been audited by Messrs. Davey and Boyden, were presented and passed.

The Council for the ensuing year having been elected, the meeting was dissolved.

In June and August outdoor meetings were held, the first at Tynora, which was mostly of a social character, and the second at From Glos, near Bristol, at which nearly all present worked, the wind which prevailed, however, cramping the amount of work which might have been done. The July meeting was prevented from being held by the weather.

Talk in the Studio.

CAUTION.—A correspondent from Portsmouth writes to caution provincial photographers against a German calling to purchase waste residues, and then contriving to get away without payment.

PHOTOGRAPHIC ILLUSTRATIONS FOR THE LANTERN.—We have received from Mr. York a copy of a highly dramatic poem entitled "Jane Conquest," for which Mr. York has produced illustrations from life studies for the lantern under the direction of

Dr. Croft. Few things can add more to the interest of a lantern evening than the recitation of a good dramatic poem with effective illustrations on the screen; and the well-known excellence of Mr. York's slides must materially aid in giving vitality and interest to the poem in question.

FOUNTS BY A PHOTOGRAPHER.—We have been favoured by Mr. W. G. Harrison, a gentleman whose name is familiar in connection with photographic and other scientific literature, with a copy of a volume entitled "Lazy Lays and Pious Imaginings." Several of the lays refer to photographic matters, and will interest photographers. Mr. Harrison has considerable facility of versification, and deals, in pleasant and humorous mood, with many scientific follies which are better laughed down than gravely disputed.

IMPROVED FILTERING PAPERS.—We have received examples of a very important improvement in filtering papers, made by Mr. T. Bom, of Cape Town. It consists in the attachment to the circular filtering paper of a lining consisting of some open fabric like net or muslin. The examples before us have a lining of what is, we believe, technically termed *lene*, a kind of muslin of very open texture. This serves two purposes, each of vital importance. In the first place, it prevents the paper clinging to the sides of the funnel in a manner which checks the progress of filtration, and it also prevents the risk of an occasionally very troublesome danger, that of the soaked paper bursting with the weight of a bulk of solution, making a troublesome mess, and wasting the work of many hours. The advantages are so obvious that they do not require enforcing. The article is patented, and will doubtless soon find its way into the trade.

FATAL ACCIDENT.—The following particulars of a melancholy accident to a son of Mr. G. Willis, the well-known landscape photographer, to whom our readers are indebted for many valuable hints in connection with landscape work, are gleaned from the *Scarborough Weekly Press*. It appears that on Wednesday, 11th of July last, George F. Willis, six years old, son of the gentleman named, was playing with other children in the timber yard of the North Eastern Railway close to a crane which was being used in lifting and removing logs. The workmen told the youngsters to get out of the way, and afterwards, when they expected all was safe and clear, the break was released, and the handle of the crane spun round. At that moment the head of the child—George Willis—was seen to come in contact with the handle. He was struck down and his skull severely fractured; the brain protruding. Dr. Horne was called in to attend him, and pronounced the case a very critical one. However, the poor little fellow continued to linger in a precarious state until death ended his sufferings despite all that medical skill and knowledge could do to preserve his life. At the inquest, evidence having been given by Edgar Willis, elder brother of the deceased, Mr. Willis, the father, stated that about five weeks after the accident witness seated the deceased opposite the window in front of the timber yard, when he said, "There's the ball that knocked my head," alluding to the ball attached to a crane used in hoisting and removing wood. Witness said, "It's the handle you mean?" "No," he replied, "it is the ball." He added that a man asked him to hold the ball while he put a bar under some wood. When the wood fell the ball "jagged" his hands and he let it go, when it dropped on his head. Witness had seen the man several times since the occurrence, and he had asked his daughters how their brother was getting on. A juror stated that the man ought to have been present, as he was censurable in allowing the boy to hold the ball up. Another juror said he was of opinion that the injury was inflicted by the crane handle, and that the boy could never have lifted the ball up high enough. Dr. Horne said the deceased suffered from a scalp wound on the right side and toward the crown of the head. The skull was fractured, and the brain protruded. He had attended him since the accident until he died. The first few days he had very little hopes of the boy's recovery, but afterwards he rallied, and his case became rather more hopeful. He continued to improve until about a fortnight ago, when unfavourable symptoms set in, terminating fatally. The injury might have been caused by the falling of the ball, but he thought it more likely to have been occasioned by the revolving of the crane handle. Several jurors considered that the workmen were to blame in leaving the gates open, and thus rendering it easy for children to get into the yard. The jury returned a verdict of "Accidental death," with an addendum expressive of their censure of the man for allowing the deceased to take hold of the ball at all.

EFFORTS OF COLOUR IN THE STUDIO.—Referring to some curious experiments recently made in Italy by a physician for the insane, and in which light played an important part, the

question considered was the influence exercised upon the insane by their being kept in rooms lighted by red, blue, and violet glass. Mr. Silvy, who was for some years the most noted portrait photographer in London, says:—"As far back as 1860," says our correspondent, "I used this process, not for the complete cure of the customers who flocked to my ateliers, but at least for their momentary relief, and for my own advantage. Thus, the first rooms in which I received my customers were hung in dark green; the ceiling green, set off with oak; the windows furnished with green blinds; the curtains of green velvet, so as to afford rapid relief to the sight of persons who were more or less excited by walking or riding in the open air. After remaining a few minutes in these two salons, they entered a boudoir hung with pink chintz, in which the ladies made their toilets, and thence passed into my atelier, which was on the same floor with these three apartments. The gallery itself was divided into three parts, one completely darkened by hangings of green serge; the other, in which the light was subdued, by a coating of white paint, which gave to the panes the appearance of ground-glass. I had green trellises placed against the sashes, and at the bottom boxes of earth, containing ivy and vines, which ascended to the top of the gallery. There were only two or three open spaces through which the light entered freely. It was thus that I obtained my effects of crisp light."

SPIRIT PHOTOGRAPHY IN AUSTRALASIA.—A correspondent favours us with a cutting from the *Otago Guardian*, which shows that the spirit photography trick has reached the southern continent. Our Otago contemporary says:—"We have received from Messrs. Burtin Brothers, photographers, an excellent photograph of the 'Trance Medium' when under the influence of the 'Control.' With eyes closed and hand extended, Mr. Walker appears in the act of addressing an audience. But, horrible to relate! to the left of him appears the shadowy form of the departed Stewart. Weird and ghostly, with aged figure bent forward, and mouth in close proximity to the ear of the medium, this heretical old parson is engaged in inspiring the medium with those spirit-truths that sound so harsh to orthodox ears in earth-life. The picture has an appalling effect. Indeed, we have heard or seen nothing in all the proceedings of the Seer which has more convinced us of the reality of the presence of the spirits, and of their direct inspiration to the medium. How Messrs. Burton succeeded in this triumph of the photographic art is best known to themselves. But can it be that through spiritual chemistry they have obtained some subtle developing fluid which can thus bring forth—dim and vague, we admit—the lineaments of the ghostly form, which are commonly unseen of human eye? Anyone who could gaze on such a picture, with the hazy figure of the ghost in attendance, without being in the slightest degree in doubt or hesitation regarding the materialisation of spiritual essences, must be a man with whom it would be folly to reason, and in all honesty we say he should be given over to the hardness of his heart."

TO MOUNT PHOTOGRAPHS.—An approved substance for mounting photographs, and that of the most equal consistence, is the white of an egg. Before mounting, dip the photograph in a basin of perfectly clean water, then lay it between a towel or piece of linen, which will absorb the superfluous moisture; place it face downward on a perfectly level and clean surface, and work the white of an egg with a small sponge on a piece of stick, or a brush, if the hairs are secured.—*Stationer.*

To Correspondents.

T. H. CHURCH.—Your last query was not answered last week. There are several modes of reducing the density of a negative; but they all require great care, as there is considerable risk of injuring the negative. If we had a very valuable negative we should prefer some other mode of meeting the difficulty. For instance, printing in direct sunlight will often give a soft print from an over intense negative. Blotting of the free silver solution after exciting the paper, before hanging it up to dry, will have a similar effect. If a negative be reproduced by means of a transparency, you may make the new negative as thin or as dense as you like. But various modes of reducing a negative exist. One is by applying cyanide carefully, another by applying tincture of iodine, which will at first slightly intensify the negative, but by continuing its action will finally make it less intense, procuring a thin straw-coloured image, which prints very slowly.

PHOTO.—The only mode of determining when prints are sufficiently toned in the gold bath is by examining their appearance and knowing by experience how much they are likely to lose in the toning bath. This experience can only be obtained by observation and practice. Some prints will lose much more than others. A well printed photograph from a good vigorous negative will not lose much in the fixing; but a weak image from a thin negative will lose considerably. Prints toned in a new bath and prints rapidly toned are apt to lose considerably in fixing. Some samples of paper lose more than others, but observation will be your best guide.

A FOURTEEN YEARS' SUBSCRIBER.—We fear that there is no mode of preventing burnishing removing the pigment employed in touching spots. The best plan is to retouch after burnishing, using very little pigment, with a little gum. Your suggestion is not a bad one. But as an old subscriber you will remember that we did at one time devote space to queries and notes thereon. We found, however, by experience that the queries in so many instances came from correspondents who were almost at a standstill for information or advice that waiting for an extra week for an answer was a serious matter, and as we could in most cases give the information required at once, we did so instead of taking up space by printing the questions in the *News* and waiting for other correspondents to answer.

B. R. F.—So far as we know, none of the methods of colouring a photograph at the back is now the subject of a patent in operation. You may experiment in that direction freely. You may use either oil or water colours for the purpose. If you use water colours, let the print be produced upon a piece of thin plain paper, colour somewhat carefully at the back, stippling with precision and delicacy, but using the colours of a fuller tint than would be necessary in colouring in the face. Then saturate the print with white wax, and place a piece of cream note paper at the back. If managed with care and skill, the result closely resembles painting on ivory. For oil colours a rougher style of painting at the back will answer, and the print is usually made transparent by means of a varnish. The more artistic the style and choice of colours, the better the effect.

A CORRECTION.—A few weeks ago we received from a friend a cutting, bearing the name and authority of the *Scientific American*, on the subject of glass, which we reprinted and accredited to that journal. Shortly afterwards we received a note from the Editor of a print produced in Liverpool, claiming the origin of the article in question, and we at once gave publicity to his claim, as our readers will remember. Still he is not happy, but finds vent for his spleen by resorting to the stale device of creating a bogus correspondent under whose disguise he can pour forth his venom on a journal he has so constantly striven, with small success, to imitate. We have, however, sufficient knowledge of contemporary journalism to know the proclivities of the specimen in question, but we also have more interesting occupation for our time and space than bandying words with a scurrilous writer, in whatever guise he may appear, and must decline to indulge his Hibernian proclivity for a row.

HYPO.—The Autotype Company do enlargements for the trade generally, not for licensees solely. Whether they sell enlarged specimens or not we do not know. You will easily ascertain by writing to them. But your best plan is to obtain specimens from your own negatives.

C. R. P. VERNON.—Many thanks. We shall have pleasure in receiving the promised communication at your early convenience.

J. WATKINS.—We are sorry for your troubles, and will help you as far as we can. It is a somewhat difficult thing to produce a good negative if you have never seen one, and do not know one when you do see it. There is no certain rule for the appearance of a negative when examined by reflected light—that is, when looked at. The proper mode is to look through the negative and see that the highest lights and portions which are to be pure white, in the print, are quite opaque, and all the other portions graduating from opacity towards transparency, the absolutely deep blacks being quite transparent. Some negatives which print very well, when looked at very closely resemble overdone positives; whilst others show no image at all when looked at. The negative you describe as quite black has probably been intensified with mercury and hypo or ammonia. To effect this, dissolve ten grains of bi-chloride of mercury (a very dangerous poison, remember!) in an ounce of warm water; apply this when cold to the fixed and washed negative. It will turn a grayish white. When the change is even all over, take a weak solution of hypo (say a teaspoonful of your fixing solution in two ounces of water) and apply to the negative. This will make the white image black, and much more intense. The unfixed prints from your own negative are not bad. Your fixing solution is the proper strength, but, as a rule, the prints should remain in fifteen minutes. If you use sufficient sugar, acid is not needed in the developer.

J. H. WORSLEY BROWN.—Plated silver is quite safe in contact with silver solutions so long as the silver surface is intact. The danger is, that if there is a trace of free acid the silver is attacked and the plating injured. A bottle with tap is a capital thing for keeping the solution. A glass tap is best.

Several Correspondents in our next.

The Photographic News, October 19, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AT THE POLYTECHNIC.—MORE REVELATIONS BY THE CAMERA.—A DEFINITION OF RETOUCHING.

Photography at the Polytechnic—Anybody who has seen a fine landscape photograph, magnified by the assistance of a vivid light to the extent of thirty or forty feet upon a screen, must be impressed with the idea that in this way only can a camera picture be fully appreciated. The tiny carte-de-visite, or sharply limned stereoscopic slide, is all very well when we have nothing else, but put the same into a lantern and throw the image upon a huge screen like that at the Polytechnic, and you are absolutely startled with the realization before you. We have seen some of Mr. England's charming glacier scenes and lofty peaks reflected in this way with such truth that one might be in Switzerland, so complete was the illusion; except that there were no seas, and one missed the cold draughty chalet which is sometimes the only shelter on a bleak mountain side. Just now the Polytechnic shows its visitors something yet more wonderful, and, comfortably seated in the big hall of the Institution, they can see a torpedo explode and throw up a jet of water exactly as the photographer saw it when he so skilfully caught the effect upon his sensitive plate before it had time to disappear. Our readers may remember that our military photographers have proved themselves adepts at securing pictures of the upheavals of water and foaming cascades which are brought about by the explosion of submarine mines; and these slides the War Office have permitted the Polytechnic Institution to avail itself of in a lecture on Torpedo Warfare, now forming one of the attractions of that favourite resort. There is no other place, probably, where the pictures could be so well appreciated, for here we are shown, one after another, the exploding of a fish torpedo and of an electric torpedo, and are, moreover, permitted to see the difference between an explosion of gun-cotton and one of gunpowder under water. There are the glistening waves before us, the shore and the shipping, and in the centre a charming column of water rising apparently a hundred feet from the surface. Nay, we are better off than the photographer and those who saw the spectacle itself. To them it was but a momentary display; before they could well look at it, the magnificent cascade of water had sunk down again, and nothing but a frothy disturbance remained. But we, who are not tossing about uncomfortably in a tug, or standing shivering upon an exposed bit of beach—we, in comfortable case, can sit watching the phenomenon for minutes together, and examine the phenomenon at our leisure. One more photograph thrown upon the screen deserves mention, as showing how much hidden beauty comes out when a picture is enlarged to these grand dimensions. It is a photograph of Constantinople, and it really appears as if the city of mosques and minarets were at our feet, and that we were looking over the Turkish metropolis from some eminence above the town.

More Revelations by the Camera.—Our readers are aware that in France photography is employed to aid justice far more than with us. Not only is there a photographic establishment connected with the Paris police, but the French law courts, when necessary, avail themselves of the services of M. Gobert, of the Bank of France, whose name is familiar to our readers in connection with many important services rendered to that institution. It is in the nature of things that the directors of the Bank should wish M. Gobert to keep any experiences he may acquire a secret, for, naturally enough, if forgers, and people of the same class, were to be informed of the discoveries that

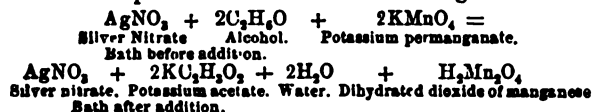
have been made, and the means taken for their detection, they might study the more how to delude their detectors and create still greater difficulties. The commencement of M. Gobert's engagement by the Bank of France was marked by a discovery which proved how valuable photography might become as a detector. A suspected cheque was photographed as a transparency, and behold! there was visible on the collodion film not only the figures which had been apparent to the eye, but others that were legible to the camera, if not to the human retina. We forget what modification had been made in the cheque, but the amount had been changed from seven hundred to seven thousand francs, or something of the sort. A bank-note, photographed as a transparency, revealed in the same way that while the date of it was one year, the water-mark was another. But the most interesting application made of the art by M. Gobert was in a recent disputed will case. The will was not only believed to be a forgery, but a person actually suspected, who had written it. The writing was not in the ordinary hand of this individual, but, nevertheless, other circumstances pointed to him as the writer. The letters were small and evenly written, so that the eye could distinguish little to base an opinion upon. But by enlarging with the aid of the camera some of the gentleman's handwriting, and carefully examining the big up and down strokes, it was found that in the former the writer's pen always seemed to splutter, or, rather, to be arrested at one point. Not much was visible, it is true, but an inspection of letter after letter in which a long upstroke was to be found, revealed the same tendency to splutter. The tiny spots of ink, or ragged indication, passed unheeded in the small writing, but, enlarged to several diameters, the characteristic feature was so remarkable as to strike everybody. A portion of the will in question was then photographed and enlarged in like manner, when again the same marks were to be seen, exactly as in the handwriting of the suspected individual. In a word, the two documents were shown to be unmistakably the production of one and the same person; and, in the end, he was convicted and punished mainly upon the evidence afforded by the camera. No wonder the Bank of France anxiously retains M. Gobert's services, and desire to keep a secret all the means employed by him to detect fraud and robbery. Photographers will remember that some fifteen or twenty years ago bankers were much exercised in mind about the uses, or rather abuses, to which they feared the art might be put, and the aid of scientific men was called in to tell our merchants and financiers what was, and what was not, possible in photography. The employment of coloured and parti coloured cheques dates from this period, but we doubt now that the photographic art has been proved to do almost anything, whether black and white upon a transparent water-marked paper is not the best protection after all. Certainly the Bank of England notes are very rarely, if ever, forged now-a-days.

A Definition of Retouching.—It is a very difficult thing, as our readers know full well, to define retouching. It is not the same as spotting; everybody admits that. Neither can the removal of a chance stain or speck be regarded as such. Some people touch up the high-lights, and strengthen shadows a bit, an operation which may not in all occupy ten minutes. This is not retouching, surely. When you remove a freckle or two, and soften down a wrinkle in the forehead, or a crease in the neck, which really does not exist in the original, or take away a little of the heavy blackness under the nostrils—why, if that is retouching, simply everybody retouches. A certain foreign photographer now exhibiting at Pall Mall shows work which, we were told, was retouched "down to the ground." In fact, the universal opinion seems to be that a very large proportion of the Pall Mall pictures are retouched, retouching being, as we heard a gentleman define it, what other people do to their pictures.

POTASSIUM AND SILVER PERMANGANATES; THEIR PREPARATION AND PHOTOGRAPHIC UTILITY.

BY WM. HOWARD.*

TAKING permanganate of potassium—it being the salt always employed—and assuming that the total organic matter in an old negative bath consists of alcohol—an assumption quite legitimate, ether being simply an alcohol modified—the following equation expresses the entire change which takes place on the addition of that reagent:—



Expressed in words, the reaction amounts to this:—Two atoms of alcohol deoxygenise two atoms of potassium permanganate, losing four atoms of its hydrogen, which forms water in conjunction with part of the oxygen obtained from the permanganate; two other atoms of the oxygen so obtained unite with the carbon and residual hydrogen of the alcohol, and two atoms of acetic acid result. This acetic acid, in its turn, unites with the potash present in the original permanganate, giving two atoms of potassium acetate, and yielding up two atoms of its hydrogen, which unite with the oxide of manganese produced by the disassociation of the permanganate, giving an equivalent of dehydrated manganese dioxide. This manganese oxide is the brown precipitate always produced by the addition of a permanganate to an organic solution; it is neutral and insoluble; simple filtration entirely frees the solution from its presence. Thus, as will also have been seen in the equation given, the silver nitrate is totally inert, neither suffering from nor taking part in the reaction. The bath, after the addition and the subsequent filtration from the precipitated manganese oxide, consists of its original quantity of silver nitrate, plus an amount of acetate of potash equivalent to the acetic acid produced by the oxidation of the alcohol and ether which it at first contained, and diluted with a bulk of water corresponding to the volume of the permanganate solution used.

The only objection which can be made to the employment of the permanganate of potassium as a negative bath oxydising agent is this: although no silver is abstracted from the bath, acetate of potassium is introduced; but, again, this statement may be made to tell somewhat in another direction. This acetate is soon decomposed by the silver nitrate, giving acetate of silver—an accelerator of exposure—and nitrate of potash. This latter compound is not at all an unusual intruder, and, being on the whole inert, is far less to be dreaded than the alcohol or other organic matter which it partly replaces. Being personally of the opinion that these generally inert salts are sometimes productive of pinholes, &c., and also holding, as an axiom, that no addition to the negative bath other than silver should be intentionally made, I have lately given some attention to the use and preparation of silver permanganate.

Before quitting the applications to which potassium permanganate can be put, I would remark that the photographic world does not yet seem to have recognized the important service which it may be made to render in determining the exact value of iron developers, which, in the case of all but very old solutions, varies almost daily. It is not my intention to enter into any details here, as I hope shortly to have an opportunity of describing an extended series of experiments on those variations.

For clearing printing baths the potassium salt has no rival; it is cheap and thoroughly effective, destroying the organic matters, albumen, &c., producing therefrom an acid which unites with the potash, and giving the usual precipitate, which requires to be removed by filtration.

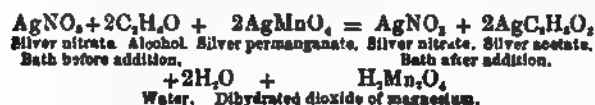
To return to the permanganate of silver spoken of above. This compound is identical in its atomic composition with

the corresponding potassium salt, having the same relative amounts of metal and acid; it is represented by the formula AgMnO_4 , and is most readily prepared by the aid of the potassium compound. As it cannot at present be procured in commerce, I will give a practical example of how it can be obtained. One atom of potassium permanganate (*i. e.*, 159 grains) was dissolved in the smallest possible quantity of boiling water; one atom of nitrate of silver (*i. e.*, 170 grains) was likewise dissolved in the smallest possible quantity of boiling water free from chlorine or chlorides. As permanganate of silver cannot sustain a boiling heat without decomposition, the solutions were permitted to cool until the thermometer registered a temperature of 150° Fah.; they were then mixed and well stirred before being allowed to cool and deposit crystals. The reaction which takes place is very simple: the nitric acid deserts the silver and unites with the potassium, the permanganic acid taking its place, forming permanganate of silver, which readily crystallizes on cooling, requiring 190 times its own weight of water for solution at the ordinary temperature—that is to say, about twelve grains forms a saturated solution when dissolved in five ounces of cold water. The above solution should, according to theory, have yielded exactly 227 grains of silver permanganate. The potassium salt was in excess of the quantity required for the total decomposition of the silver nitrate, to the extent of 9-10ths of a grain. The actual yield was exactly 154 grains; this shows a loss of 32.6 per cent. on the theoretical quantity expected. This can, however, be accounted for by the processes which the product underwent after crystallization. When the crystals had been allowed a sufficient time (about twelve hours) to deposit themselves, they were, with the supernatant liquid, thrown into a funnel the neck of which was filled with small fragments of clean broken glass and allowed to drain well. They were then copiously washed with cold distilled water, to avoid decomposition, which would have taken place by washing with common water containing organic impurities. This washing answered the double purpose of removing any small amount of the potassium salt which might have escaped decomposition; it also removed the nitrate of potash which was present in the mother liquor. The washing was continued until the addition of a few drops of a solution of common salt gave a copious precipitate of silver chloride when added to the drainings proceeding from the funnel. This test showed pretty clearly that the silver permanganate was freed from extraneous bodies, and was dissolving freely in the wash water. The crystals were then permitted to drain for some hours, the funnel being covered with a glass plate to exclude dust. They were afterwards dried thoroughly in the water bath, and then their weight was ascertained.

The crystals so obtained are very microscopic in size, and of a very deep purple colour approaching to black. By dissolving the original salts in larger quantities of water, they may be obtained of good size, but of course the quantity obtained will be less. They must never be thrown on to a filter paper to be washed; this would result in their decomposition. A funnel having its neck filled with asbestos, broken glass, or glass-wool can alone be employed. A water-bath for drying these or other crystals or salts may be improvised out of a glue-pot, using the enamelled glue chamber to hold the crystals, closing its top with a small bung, through which a hole is bored to admit a small glass tube for the purpose of carrying off the steam. The body is used for its general purpose of water holder, and the heat most conveniently applied by a gas flame or spirit lamp. The washings from permanganate of silver should go into the waste jar.

But it will be asked, What are the practical advantages of silver permanganate as compared with the potassium salt? Briefly these: When an alcoholic solution is treated with it, there are produced directly silver acetate and the dehydrated oxide of

manganese, as against potassium acetate or nitrate and the manganese oxide which the last named salt gives. Again, the lesser solubility of this salt reduces the chances of adding an overdose to the bath. The reaction of this silver permanganate on an alcoholic solution of silver nitrate is as follows:—



It will be readily seen from the above that not only does the bath lose none of its silver, but experiences an actual gain of that metal in the very form—acetate of silver—which adds to the value of old baths, and this without any drawback in the form of inert or injurious introductions. Regarding the method of adding permanganates, whether silver or potash, the bath to be operated on should, if acid, be first neutralized with carbonate of soda—this to avoid any danger which might occur through solution of the manganese oxide produced by the reaction. It is well to separate a portion—say half an ounce—of the neutralized bath from the main body, and keep it in another vessel. Then proceed to add the permanganate solution till all alcoholic odour disappears, and a decidedly pink tint pervades the liquor and remains permanent for some time. The solution held back may be employed to destroy this trace of free permanganate when it has been ascertained that the tinge is permanent. A few drops suffice for this.

Though heat is not absolutely necessary, the action of the permanganate is accelerated by warming the bath solution to 90° or 100° Fah. This also makes the manganese oxide subside more rapidly, thus enabling the operator to decide with greater certainty when the pink tinge makes a permanent appearance, because, if the bath be very alcoholic, the presence of the suspended manganese dioxide masks this appearance.

PHOTOGRAPHIC PRINTING BY MEANS OF PIGMENT POWDERS, PERCHLORIDE OF IRON, AND TARTARIC ACID.

BY M. L. A. POITEVIN.*

IN 1860, when studying the action of light upon a mixture of perchloride of iron and tartaric acid dissolved in water and spread upon a ground glass surface, where it forms on drying an amorphous film, dry and hard, I remarked that after printing under a negative, in all three parts where the light had acted, proto-chloride had been formed, and that upon this surrounding moisture condensed, so that the film was capable of retaining any powder spread over the surface with a brush. The powder, too, adhered in proportion to the amount of light which had struck the film, and thus modified the mixture, while all parts of the surface which had not been acted upon remained dry, and did not take up any pigment powder.

Upon this experience I grounded the undermentioned process, which furnishes permanent photographs:—I prepare the surface (a glass plate previously ground) with a mixture made up of an eleven per cent. aqueous solution of ordinary perchloride of iron and a five per cent. solution of tartaric acid. After spontaneous drying, away from the light, I put the prepared surface under a negative, and expose for a few minutes to the sunshine. Then in the dark room, illuminated by a suitable window, I withdraw the ground-glass from the printing frame, and pass over it a brush with carbon powder, or any other pigment, in a finely divided state. This colouring matter immediately adheres to the parts which have been exposed, and in proportion, as I have said, to the amount of light that has penetrated through the negative; by continuing the

operation, therefore, I very soon form a photographic image by the adhering powder. I cover the pigment powder thus adhering to the surface with some normal collodion made by dissolving four parts of pyroxiline in one hundred parts of an alcohol-ether mixture; the plate is plunged into water until the greasiness disappears from the surface, and then there is poured upon the collodion some acidulated water. After further washing with ordinary water, I apply to the image a piece of moistened paper smaller than the glass plate, rub away all round, and then lift the paper by one of its corners. The paper brings away with it the collodion film and the pigment image; the film of collodion is next placed upon a sheet of paper gelatinized on one side only, and the image is then found to be fixed between the film of gelatine and that of collodion.

This process has furnished me with some very fine pictures; it is a very inexpensive and practical method of producing carbon prints, although many prefer to it the employment of carbon tissue.

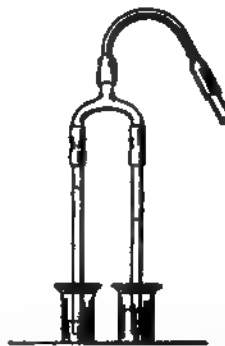
This same process of perchloride of iron and tartaric acid, which I was the first to demonstrate and practise, is also widely used in the preparation of vitrified photographs and enamel pictures.

ON A SIMPLE SPECIFIC GRAVITY APPARATUS FOR LIQUIDS.

BY JAMES TAYLOR.*

It is often desirable to ascertain approximately the specific gravity of a liquid in cases where the hydrometer and specific gravity bottle are not applicable, or would take up too much time. The following contrivance answers very well for this purpose, is very readily applied, even with tolerably small quantities of liquid, and easily gives results correct to the first decimal place.

Two straight pieces of glass tubing, five to ten m.m. bore and two hundred and fifty m.m. long, are joined by caoutchouc tubing to two ends of a T-joint which have been bent so as to be parallel. The third end of the T-joint has



a piece of caoutchouc tubing of convenient length slipped on, and this is stoppered by means of a bit of glass rod. Two small beakers, a rule, and any convenient stand arranged so as to hold the long tubes vertically, complete the apparatus.

Its application is almost obvious. On pouring a little distilled water into one beaker, and the liquid whose specific gravity is to be determined into the other, bringing the beakers under the two vertical tubes so as to immerse the ends of the latter in the respective liquids, and partially exhausting above, the liquids will rise to heights depending on their relative densities. The plug is now inserted, the lengths of the liquid columns are measured, and the specific gravity required is obtained by dividing the length of the water-column by that of the other.

* *Annales de Chimie.*

* *Chemical News.* We are also indebted to the courtesy of our contemporary for use of the diagram.

THE PHOTOGRAPHIC EXHIBITION.

[From the DAILY NEWS.]

The annual exhibition of the Photographic Society of Great Britain, now on view in Pall Mall East, affords incontestable evidence of the state of perfection to which photography has reached. It was only the other day we recorded the death of Mr. Henry Fox Talbot, who discovered the secret of what was vainly attempted to be familiarized under the name of "Talbot-type," but which we know as photography. Thus within the limits of a generation, or at least of a single lifetime, the process which Mr. Talbot discovered and elaborated has developed into one of the fine arts. In the work of development in the direction of artistic perfection, the Photographic Society of Great Britain have done distinguished service. They stand to photographic artists in the same position as the Royal Academy stands towards painters. Like the great association which has its headquarters a little further west, the Photographic Society have their committee of selection, and a foot-note to the catalogue, expressing regret that "limited space" has prevented them from hanging a large number of proffered pictures has quite a familiar look about it. In spite of these rejections, there are nearly six hundred photographs exhibited, dealing with subjects of all classes. Many of the exhibitors are amateurs, among the list being the familiar name of Colonel Stuart Wortley, who shows a series of studies of wave and cloud. The Royal Engineers' School of Photography are liberal contributors, and the Woodbury Company and the Autotype Company take advantage of the opportunity of bringing their special processes under the notice of the public. But perhaps the most interesting section of the exhibition is that devoted to the photographs taken during the Arctic Expedition, and lent by the Lords of the Admiralty. Of these there are one hundred and seven, and they constitute a unique pictorial record of the Expedition. There is a fine photograph of the Expedition at anchor in the harbour at Disco, showing the *Alert*, the *Discovery*, and the *Valorous*, with their withers as yet unwrung by the grip of the Arctic iceberg. Further on we have the *Discovery* fast in the ice at Cape York, with a group of native dogs and sledges in the foreground. Then there is the *Alert* beset in Hayes Sound, on what was to us a summer night in August two years ago. There a picture of the smithy and theatre knocked up at the winter quarters of the *Discovery*; another of a sledge journey, with a party from the *Discovery* going to make an afternoon call on their comrades of the *Alert*, and lurching midway on an ice floe. The various processes of "cutting out" are shown, and there is an interesting view of the post-office cairn at the *Discovery's* winter quarters, an establishment built with the rified preserved meat tins. The Expedition were fortunate in having amongst their number a gentleman capable of taking these photographs, and the Photographic Society are not less to be congratulated on being furnished with the opportunity of exhibiting them to the public.

[From the MORNING ADVERTISER.]

The annual exhibition in connection with the Photographic Society of Great Britain, which is now open at the well-lighted room of the Society of Painters in Water Colours, 6A, Pall Mall East, is, perhaps, the largest ever held under the same auspices. It comprises over five hundred and fifty frames, besides stereoscopes, albums, lantern slides, fac-similes of ancient manuscripts, and a variety of photographs taken during the Arctic expedition of Sir George Nares, which are lent by the Lords of the Admiralty. To the practical photographer the exhibition is one of the greatest interest, affording as it does a complete review of the various developments of sun-painting up to the most recent period; while to the connoisseur and lover of the beautiful, as exemplified in monochromatic art, it affords a treat of the highest order. There are, however, no startlingly new processes upon which to dwell—no surprises such as have awaited the visitor on some preceding occasions. The tendency of late years has undoubtedly been towards greater perfection in already discovered processes; towards completeness and refinement, in fact; and so long as scientific efforts are put forth in this direction there is reason to believe that much may still be accomplished with the materials at hand towards elevating the art of the photographer. Year by year the uninitiated observer of these interesting exhibitions finds greater difficulty in selecting works for special mention, the performances being more uniform in quality. Formerly, the productions of some half-dozen exhibitors stood out, as it were, in bold

relief from the surrounding works of mediocrity; but now, owing probably to the larger field of selection offered the committee, or to a more rigid exclusion of commonplaces, merit in varying degrees is conspicuous at every turn, and throughout the entire collection it would be a task of no small difficulty to single out examples that should have been relegated to the limbo of the rejected. In portraiture the studies of Schweiz Täschler are entitled to prominent notice. They are chiefly full lengths, charmingly posed and judiciously lighted. Some of them are carbon printed, and present the appearance of exquisitely finished mezzotints. Schulz and Scuck, of Carlsruhe, also contribute some artistic portraits by the carbon and silver processes; and the portraits by Bernard Mischewski, of Dantzic, are beautiful specimens. It is noticeable that photography pure and simple and photography "touched" by the artist are getting further and further apart, and it is not easy for anyone who is not an expert to tell where the one ends and the other begins. The question is, whether this "touching" business is not getting rather overdone. It undoubtedly improves the raw material of the photograph, especially in flesh tinting, but if this working up by the artist is to go on, the word "photograph" will not correctly describe the art. Amongst the British exhibitors, Valentine Blanchard's "Study of an Old Man" is worthy of the highest commendation, being thoroughly lifelike and expressive; and the same may be said of Mr. Blanchard's portraits, of which there seem to be fewer examples than usual. The style of portraiture on porcelain exhibited by Lombardi and Co. is highly finished with a miniature-like softness, very suitable for ladies and children, but hardly likely to bring out in sufficient relief the coarser elements of life. The specimens, however, are essentially artistic, and of their kind have never been surpassed. G. Nesbitt, of Bournemouth, also exhibits some good portrait studies and *genre* subjects, amongst the latter being "Tired Companions," a child lying on the floor with a mastiff, the freedom of which is worthy of all praise. A glance at the subject pieces is sufficient to show that photographers fail as a rule in posing their figures, or, it may be, the sitters fail to meet the operator's requirements. Whatever may be the cause, there is in most of the *genre* studies a manifest consciousness on the part of the sitter that he or she is a sitter. The idea, the episode, the story sought to be em painted is good enough, but the fixed result comes out transparent and hollow. The smile is an evident feint, or that look of surprise, contempt, or concern is clearly "put on," and unreal. This is the fault of photographic *genre* in nine cases out of ten. It may be seen in this room in a number of examples which need not be specified. Mr. Nesbitt, however, has avoided this fault, and his "Tired Companions," in particular, is cited as an excellent production. Entitled to similar praise is the "Cross Purposes," by E. Cocking, a perfectly natural scene from *The Happy Pair*. "Alone," a young lady seated by the sea-shore, with a basket of wild flowers, by R. Slingsby, of Lincoln, has some commendable features, the figure and accessories being admirably reproduced. Harry Pointer, of Brighton, contributes some funny cat and dog studies from life; A. Boucher, another Brightonian, is represented by some good portraits and figure subjects; while E. Fox, of the same town, is content to send a couple of his outdoor studies. The Autotype Company and the Woodbury Company are, as usual, largely represented. Their carbon enlargements are wonderful examples of photography. Their prints in permanent pigments, enlargements from negatives, copies from paintings, and other mechanical printing processes are exceedingly beautiful developments of the art. The Woodbury Company exhibit specimens of surface printing from metal plates, and the Autotype Company show their enlargements from cartes by the auto-mechanical printing process. Amongst other noteworthy exhibits is a frame of photo-etchings by F. Gutekunst, of Philadelphia, the etching being executed upon the film with a steel point. The black lines of the etching are distinctly visible on the foliage, drapery of the figures, and other details, but the flesh is left in its original state. At first sight the photo-etching has the appearance of a double printing. Colonel H. Stuart Wortley contributes several frames of sea and cloud studies, snatches of nature in her most evanescent moods; and the Royal Engineers' School of Photography, Chatham, is represented by a variety of landscape views, some of which are highly commendable. It may be remarked generally that the landscape studies are quite up to the usual standard of excellence. The Arctic Expedition photographs are interesting, but from an artistic standpoint lay no claim to special notice.

[From the SOUTH LONDON PRESS.]

Photographers may fairly be congratulated on the very excellent collection of photographs which was opened to the public on Wednesday, at the Gallery, 52, Pall Mall East. While the absence of colour gives to the walls a somewhat sober appearance, any shortcoming in this respect is fully atoned for by the evidence of care and study which an examination of the various works reveals. It is certainly pleasing to find that photographers are profiting by experience, and as they gradually learn to feel where their real strength lies, so will improvement be evident. Not many years ago the tendency was to aim at photographs of large size—not by means of enlargement, but direct from the camera—and the result was the production of monstrosities perfectly appalling after the first sensation of wonder had worn off. There was also a period when what was termed “softness” was the “be-all” and “end-all” of photographic art, and Mrs. Cameron, praised as she was by artists—and in many instances deservedly so—out-Heroded Herod with distorted portraits with woolly outlines and exaggerated features. We have had a “composition” mania, where the artist, by means of half a dozen negatives, pieced together a picture which in some cases was effective, but as a general rule absurd and incongruous; and lastly, there has been a time when photography was almost lost sight of altogether, and the pencil substituted so as to “improve” the negative, and, through it, the human face divine. Indeed, to such an extent has this been carried, that in several instances nature literally has been beautified completely away. Bearing these facts in mind, it is gratifying to find that the collection of the present year contains less examples of “vaulting ambition” than any previous exhibition which we can call to mind. At the same time, it must be admitted that there is still a good deal of ugliness which one would like to see reduced. What satisfaction can a representation of a commonplace countenance give to anybody, no matter how perfect the manipulation of the photograph may be? Or, turning to more ambitious work, what interest does anyone feel in a picture when the story told—if story it can be termed—is without point, and the models not only wooden in expression, but positively repulsive? We forbear picking out examples of this kind of thing in the present exhibition, but would point to what can be done with simple materials in the opposite direction. Mr. Faulkner's pictures of children, for instance, are the perfection of good taste and artistic treatment, while for simplicity and breadth, the “Study of an Old Man” (No. 275), by Mr. Valentine Blanchard, of Regent Street, could not well be surpassed. Of course it may be said that these gentlemen owed their success to their good models. Probably; but as we have simply to look at the result, with that we have nothing to do. Coming very near to the standard we have laid down is Mr. R. Blingby's “Alone.” This is really a beautiful picture, and one feels an absolute pleasure in looking at it. The large composition picture of Mr. H. P. Robinson, Tunbridge Wells, will attract attention, and is undoubtedly a clever piece of work, the management of light and shade being both effective and artistic. But the two figures!—was it worth while spending so much time and ingenuity over them?

Of the few foreign specimens, the work of Feller and of Klary pleases us best. M. Klary's are chiefly examples of Algerine life, and are extremely interesting. Delicate and yet forcible, the specimens of American work set an example which our artists would do well to follow—at all events, in a commercial sense. America, however, is not represented in the exhibition to any large extent. With the examples of landscape work it is not so easy to find fault. There are indeed some beautiful specimens, and the best to our taste in the small size. The productions of Mr. Matthew Whiting, of Lavender Hill, and of Mr. Peter Mawdsley, of St. John's Hill, Wandsworth, are perfect of their kind, and in the same direction are those of Mr. Frank Howard (South Lambeth). The latter gentleman's work, however, is spoilt through an extreme coldness of tone. Mr. W. England, Mr. Payne Jennings, Mr. Bowness, the Royal Engineers' School of Photography, and Lieut.-Colonel Wortley—all show exceedingly fine pictures; and interesting also are the Arctic views by Mr. W. J. A. Grant, who accompanied the recent expedition. South London, we may say, is well represented. In addition to the names we have already mentioned, Mr. S. Fry (Sarbison) has a clever picture, entitled “The Taxidermist,” which would have been better had not the figure from its small size the appearance of

being overwhelmed by its surroundings. Mr. H. Garrett Cocking (Lee and Sydenham) shows a very good representation of the interior of St. James's, Hatcham, but scarcely does himself justice in his other contributions. Mr. E. Cocking (Queen's Road, Peckham) exhibits a clever genre picture, and Mr. W. Brooks has some good view of Reigate and its neighbourhood. Mr. W. Cobb's studies are technically good, but otherwise uninteresting. Mr. J. W. Edwards, Albany Road, Camberwell, exhibits some copies of statuary; Mr. M. V. Harman (Bromley), studies of animals and Kentish scenery; Mr. H. Baden Pritchard, a picture entitled “Waiting to Go On,” Mr. J. C. Steuning (Beckenham), the interior of a fernery; and Mr. Leon Warneke, of Peckham Rye, some specimens of photo-engraving, and experiments in enlargement. Last, but not least, are the exquisite specimens of carbon printing by the Autotype Company and the Woodbury Company. The surface-printing of the latter is absolutely perfect, and opens up a wide field of speculation as to the possibilities of the photographic art. On the whole, the exhibition is well worthy of a visit.

THE DISCOVERER OF PHOTOGRAPHY.

MR. J. SMITH writes as follows in *Nature*:—

In your account of the death of Mr. Fox Talbot (*Nature*, vol. xvi. p. 464), you state that he first entertained the idea of the art of what is now called photography in 1833, and that it was not till 1839 that he and Daguerre first made known the principles of photography under the name, I think, first of Daguerrotype, followed by Talbotype. I therefore think the following notes concerning Niepce may interest some of your readers:—

I cannot now from memory give exact dates, but I think it was at least ten years previous to 1839 that there lodged in a neighbouring house to where I now reside a Frenchman of the name of Niepce; he was, I think, engaged on a perpetual motion machine. He died, which necessitated his brother coming from Paris to Kew. The brother was a theatre scene-painter, and had discovered the art of fixing upon metal the pictures of objects reflected by the sun. On arriving at Kew he put up at the “Coach and Horse” Inn, then kept by Mr. Casel, and not being able to speak English, Mr. Casel introduced him to Mr. Francis Bauer, the celebrated botanical artist, then residing at Kew. Niepce had brought with him three pictures, specimens of his discovery, which he showed to Mr. Bauer, who became much interested in them. He deemed the discovery worthy of being made known to the Royal Society, but as the method of obtaining the pictures was not described in the notice sent to the Society, they would not entertain it, and nothing was done in the matter. Niepce returned to Paris, leaving two of the pictures with Mr. Bauer, and the third with Mr. Casel in part payment of his bill, he being a poor man. Being a frequent visitor to Mr. Bauer, the latter naturally called my attention to the two pictures that hung in his room for at least ten years. In time Niepce let the secret of his discovery become known to M. Daguerre, and in 1839 this discovery came before the public under the name of “Daguerrotype,” and about the same time “Talbotype” was announced. This led Mr. Bauer to write a letter to the *Ateneum*, fully explaining all particulars of what I have here stated from memory. In his letter Mr. Bauer said he should be happy to show the pictures to those interested in the subject. Consequently he had many callers, one of the earliest being Dr. Percy, whom I remember coming to me, wanting to know where he could find Mr. Casel, who had then retired and was living at Richmond. Dr. Percy went off to Richmond with the intention of buying the picture, but I remember telling him Mr. Casel would not sell it, as he was not in need of money. Much was the case, as Mr. Casel told me some time after “that he would not sell it; no! not if he was offered £100 for it.” Mr. Casel is long since dead, and what became of his picture I know not. After Mr. Bauer's death, in 1840, these two pictures came into the possession of his friend, Mr. Robert Brown, and I believe are now in the British Museum.

[If we remember rightly, the heliograph belonging to Mr. Casel eventually came into the hands of Mr. Joseph Ellis, an early and enthusiastic amateur, in whose possession we saw it. Mr. Smith is in error in supposing that Niepce's discovery was finally published as the *Daguerrotype*. The processes of Niepce and Daguerre were essentially different.—*Ed. Photo News.*]

The Photographic News.

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THE PHOTOGRAPHIC EXHIBITION.

LANDSCAPES.

THE Exhibition of the present year is poorer in landscapes than, perhaps, in any other department, and poorer, also, than many former years. It is not to quality we refer in using the term poverty, but to numbers. Many of the fine landscapists are entirely unrepresented—Bedford, and Earl, and Heath, and Bool, Manners Gordon, Henry Cooper, Sanderson, Hudson and others—and as there are few others to fill their places, the number of fine landscapes is necessarily smaller than when all or some of these contributed. But there are, nevertheless, many landscapes of very high quality, from old and familiar contributors, whose work is always welcomed.

Very striking as a novelty is Mr. Gutekunst's panoramic view of Centennial grounds and buildings at Philadelphia, printed from seven negatives, on one piece of paper, and forming a picture about nine feet long by one foot deep. The technical difficulties of securing the negatives so as to join harmoniously, and to print so as to secure perfect equality of depth and tone, and so to secure unity in the picture, are very serious, but they have been perfectly overcome, and the print is as perfect in all respects as if it had been printed from one small negative. Mr. Gutekunst's celebrity in his own city, and, indeed, in the United States, is as a portraitist of great skill, but his landscape work here might challenge comparison with the work of the most experienced landscape photographers. Amongst the new names we welcome amongst the contributors is that of Mr. M. Bowness, of Ambleside, who has done full justice to some of the charming scenery in the midst of which he resides. His landscapes, selected from the English Lake districts, are of a large size, and exceedingly fine, and selected with admirable skill and care in securing picturesque points of view, leaving nothing to desire in technical excellence, as they are delicate and full of atmosphere, and as brilliant as is compatible with the due rendering of atmosphere. They appear to be in most cases mounted in actual contact with the glass, by which they gain greatly in delicacy and brilliancy. His "Stybarrow Craig, Head of Ullawater," is especially fine; and his "View on the River Brathay, Ambleside" (41), is also a very charming picture. Mr. Crawshaw sends some of the finest landscapes in the exhibition. We have before referred to a view of Brecon (39) as very fine. It is an admirable example of picturesque selection: the choice of point of view, making the bridge a prominent foreground object, is the making of the picture. The fine judgment and discretion with which clouds are introduced into Mr. Crawshaw's pictures is an element of rare excellence. A great improvement in landscape photography

has, during the last few years, become common. The hideous expanse of white paper which used to do duty for a sky, and made the foreground often look as if it were cut out in sticking plaister and stuck on a piece of white paper, is no longer seen. But there is another danger imminent. It is so easy to print in a sky to a landscape, and a fine piece of cloud will so often make a commonplace foreground into a picture, that there is a great temptation to overdo the thing—to print the clouds too deep, so as to secure their full effect of light and shade; to mass too much cloud effect in one picture; and, above all, to use unsuitable and incongruous cloud effect. We see occasionally sunlit clouds over landscapes lit by diffused light only; sunset clouds over foregrounds lit by the midday sun; and, at times, silver-edged clouds lit by the declining western sun, and a foreground strongly illumined by the eastern sun of the morning, or the southern sun of noon. It should be remembered that truth to nature is the imperative condition in producing combined effects in photography. Combination in printing is only a *pis aller*, often of the utmost value in producing artistic work, but, at times, altogether offensive and unjustifiable when used to delineate combinations impossible in nature, at once incongruous and inartistic. One of the charms of Mr. Crawshaw's work is the fine taste with which the clouds are introduced, and the delicacy with which they are printed and combined. Belonging as much to landscape as to portraiture are Mr. Crawshaw's picnicing groups, which are admirable in grouping and in the landscape background and surrounding. The groups of volunteers are most intractable material to deal with for all picturesque purposes, but here the difficulties are fairly combatted, and the technical qualities of the photographs are very excellent.

The school of photographers belonging to the Royal Engineers at Chatham do justice to Captain Abney's training, and send several very fine photographs from an artistic as well as technical point of view. Their scenes in Deer Leap Wood are very fine, and the untouched enlargement of the Great Beech in Knowle Park is admirable. Mr. Frank Howard's charming little bits (61, 62, 63) illustrate how perfect as pictures very small photographs may be; a fact also further illustrated, if it needed to be enforced, by the very choice little landscapes by the coffee process (398) sent by Mr. J. H. Whitehouse. Unfortunately these are not sufficiently on the eye-line to allow a facile examination of the rare delicacy of these views. A very huge carbon enlargement, from a negative by Mr. Sawyer, is sent by the Autotype Company. The subject is Windsor Castle, which is well rendered, with the river for foreground. A man just pushing a boat off from the shore gives vitality and interest to the picture, which is altogether a fine one. A series of fine landscapes, under the general title of "Picturesque England and Ireland," is sent by Mr. Payne Jennings. All the examples are very good. Mr. England, who has been absent as a landscape contributor for some years, sends some of his very fine Swiss views, all taken on dry plates. They all illustrate the careful, painstaking character of the photographer, and have the same qualities which at all times distinguish Mr. England's work, no matter what the process—wet or dry. There is a great deal of very good dry plate work at this exhibition; but the general impression it leaves is one in favour of the results of the wet process. Mr. W. Brooks sends some pretty bits by the emulsion process. Mr. Beasley's work, with Fothergill plates, is always good. Mr. Annan's "Summer Evening" and "Autumn Evening" are very fine. Mr. Brownrigg, as usual, sends capital illustrations of the beauties of Irish scenery. Here is a view in "Wicklow Glen" (179) which is very beautifully soft, delicate, and luminous, although in nature so sheltered from light that it might seem the despair of photography. Mr. T. B. Hutton sends some fine examples of the comparatively little-known beauties of the Channel Islands. Mr. Reuben

Mitchell's views of a "Lancashire Mill Pool" are very picturesque, as his work usually is. Signor Carlos Relvas, of Lisbon, an enthusiastic amateur, sends some good examples of landscape work. A frame, numbered 368, but without name or title, either on the frame or in the catalogue, is well worthy of examination for the exquisitely artistic and delicate little bits it contains. Mr. Stephen Thompson has several very fine small pictures, all showing fine taste and skilful execution. Mr. Blynham Jones sends several contributions, all of them characterised by fine artistic taste and good workmanship. Mr. Peter Mawdsley's views are admirable illustrations of the excellence of the Liverpool plates. Mr. Grant, in some of his Arctic views, illustrates the same fact.

A very interesting series of photographs, taken during the Arctic Expedition under Captain Nares, is exhibited. A curious circumstance strikes us at the outset. These views are catalogued as lent by the Lords of the Admiralty. They are, however, announced on the mounts as published by the London Stereoscopic Company, which affords a satisfactory assurance that they are open to the public. But neither in lending them, nor in publishing them, does it seem to have occurred to "My Lords" to mention the name of the photographer to whose skill and endurance these photographs were due. Quite otherwise is the fact in relation to the photographs taken in a similar expedition on board the *Pandora*. Mr. W. J. A. Grant appears to have had the permission of Captain Young to exhibit, and in his own name, as in signing articles for the expedition it was a condition that nothing was to be published without such consent. Both series of photographs are full of interest, and very good work indeed, when the technical difficulties are remembered. It is scarcely necessary to commend both series to the attention of visitors.

M. G. S. Penny exhibits some interesting illustrations of the working of Kennett's gelatine pellicle, in the form of some good views. A variety of Japanese views by Stillfried and Anderson, whose names suggest a Scandinavian origin, are fine photographs, and very interesting. Mr. H. Mansfield, Mr. W. H. Bellchambers, Major General Vivox, A. Dudman, Mr. J. Milman Brown, Edward Brightman, and others send good landscapes, which we have not space to notice in detail.

MEDALS AT THE AMSTERDAM EXHIBITION.

We are favoured with the report of the jury appointed to make awards at the International Exhibition of Photographers at Amsterdam. As we noticed when the exhibition was first announced, the offer of medals was an extremely liberal one, and it will be seen that every English photographer who contributed has received a medal.

The large gold medal offered by the City of Amsterdam is awarded to Mr. P. Oosterhuis, of Amsterdam. In relation to this medal the jury remark that, if they had not been prohibited by the conditions from awarding this medal to a foreigner, the firm of Wegner and Mottu, who had sent most important contributions in every branch of photography, would have received it. The fact that M. Mottu was a member of the jury also placed him *hors concours*.

A silver medal was awarded to Mr. A. Leisner, of Waldenburg, for photo-enamels.

A gold medal was awarded to Mr. Henry Rocher, of Chicago, for the best contribution, technical or artistic.

The gold medal for the best prints in fatty ink was not awarded, the jury being of opinion that none of the contributions was worthy of the gold medal. A silver medal was awarded to Mr. Martin Roumel, of Stuttgart, in this class, and bronze medals to Mr. A. Cadot, of Brussels, and Mr. J. C. Hameter, of Dordrecht.

A silver medal was awarded to Messrs. Taeschler Freres, of St. Fiden, for the best carbon prints, and bronze medals to Mr. J. W. T. Offenbergh of Amsterdam, to Mr. A.

Greiner of Amsterdam, and to Mr. J. G. Hameter of Dordrecht. A fourth bronze medal was not awarded.

A silver medal was awarded to Mr. Gutekunst, of Philadelphia, for his combination print of the Centennial Exhibition buildings.

A silver medal was awarded to Mr. S. Kiewning, of Stettin, for the best large direct photograph, "double-extra size," not enlarged, and also one to M. le Baron Stillfried, of Yokohama; and a medal in bronze to Mr. D. Niekirk, of Amsterdam. Three other bronze medals in this class were not awarded.

The silver medal for enlargements was not awarded, no pictures of sufficient merit having been contributed. Bronze medals were, however, awarded to Mr. Herman Koch, of Neuviel, and to Mr. J. W. F. Offenbergh, of Amsterdam. Two bronze medals were not awarded.

For the best portraits, without consideration of size, the jury had doubts as to awarding any silver medal. The following silver medals were, however, awarded:—Mr. Charles Bergamasco, of St. Petersburg; Mr. S. Fry, London; and Mr. J. B. Feilner, of Bremen; and two bronze medals to Mr. C. Kirch, of Amsterdam, and Mr. M. Buttinghausen, of Amsterdam.

For the best landscape, without consideration of size, silver medals, Mr. Armand Daudoy, of Namur; Mr. Penn, of Ootacamund; and bronze medals to Mr. D. Niekirk, Amsterdam; Mr. J. Hallez, Dinant; Mr. M. Boumaus, of Maestricht; and to Mr. G. Stöckel, of Ronne.

A bronze medal to Mr. David Hedges, of Lytham, for studies of animals. Three other bronze medals and two silver ones were offered in this class, but Mr. Hedges was the only competitor.

A bronze medal to Mr. A. Bakker, of Zaandam, for photographs of microscopic objects. Five other medals were offered, but there was but one contributor in the class.

Two silver medals and four bronze medals were offered for the best reproductions of pictures. There were, however, but two contributors in this class; the first M. Mottu, who, being on the jury, was *hors concours*; and Mr. Oosterhuis, who, having received the large gold medal for the totality of his work, could not receive a second.

For the best objectives, and the best photographic articles, a silver medal was awarded to Mr. F. Beyrich, of Berlin, and a bronze medal to Mr. George Hare, of London. A second silver medal and three other bronze medals were not awarded.

For the best negatives on glass and the best transparencies on glass, a silver medal to Messrs. Reichardt and Lindner, of Berlin; a bronze medal to Mr. G. Hameter, of Dordrecht; and a bronze medal to Mr. C. W. Bauer, of Middelburg. Two bronze medals and one silver were not awarded.

Bronze medals for the most interesting photographs or photographic articles not produced by themselves, were awarded to Mr. A. W. Groote, Amsterdam; Mr. L. C. Dulok de Wit, of Amsterdam.

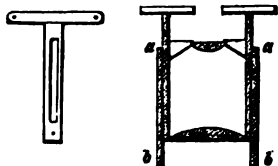
In examining the above interesting list of awards, we cannot help a feeling of regret that so few English photographers contributed to the Exhibition, and believe that if they had the jury would in most cases have been spared the pain of reserving medals at their disposal, either for want of competing pictures, or lack of merit in the contributions.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

HAVING now described the condenser, collimator, prism (or prisms), and camera with its lens, the necessary description will be given for putting up the apparatus. To begin with the collimator. It is first of all necessary that the slit should

be at such a distance from the lens that the rays coming through the latter should be parallel. At first thought this may seem rather a hard thing to secure, but, on a little consideration, it will be found quite simple, particularly when put in the following form:—If the rays coming from the slit have to be parallel rays on leaving the lens, then parallel rays entering from the outside of the lens should be focussed at the slit. The problem is now reduced to the greatest simplicity. The lens is the camera lens; the collimator tube the camera; and the position of the slit answers to the position of the focussing screen. Now, parallel rays enter the lens from any distant object; therefore, by pointing the lens at some distant object the adjustment might be made by means of the inner draw tube, so that an image received on a small piece of ground glass placed against the widely-opened jaws of the slit should appear in focus. For rough purposes this might be sufficiently accurate, but it is better at once to get the greatest possible nicety of adjustment, and, when found, to mark on the draw tube carrying the slit the position (or positions) that the end of the main tube of the collimator should occupy (see fig 1). To attain this accuracy the employment of a small Ramsden's eye-piece, of some ten to twenty times magnifying power, is useful; the one employed by myself is taken from my direct vision spectroscope. To it is attached a draw tube which fits rather tightly.



To adapt this magnifier for the purpose required a fine line in ink is made on a perfectly flat piece of glass, and the end *bb* is placed near it; the tube carrying the lenses is shifted till the line appears accurately in focus. Any object, therefore, occupying the position of the plane touching *bb* will be in focus, or, what is the same thing, any image of an object. If now the eyepiece adjusted as described be placed on the brass work forming the jaws of the slit, all that is necessary to secure the proper distance of the slit from the collimating lens is to move the draw tube carrying the slit till a distant object is sharply defined by the eyepiece. Proceeding as indicated, however, it will be found that there are two positions for the draw tubes at any point between which the image will appear in focus. At one extreme the object will be encircled with a blue fringe, and at the other by a red fringe. This is due to the lens not being perfectly achromatic, and if it be required to photograph the blue end of the spectrum the latter focus should be chosen, and if the red end the former. It is a good plan to mark on the draw tube the limiting positions of focus. With the eyepiece the same precautions may have to be taken, and it may here be remarked that the shorter the focal length of the eyepiece the greater is the precision of focus that can be obtained. The reason why such stress is laid on the focal length which is to be employed is, that for really good work strictly parallel rays should fall on the prisms, otherwise the breadth and intensity of absorption lines to be delineated will be affected.

Having thus adjusted the collimator, it is placed so that its axis is in a line with the rays to be analysed. Supposing we are using sunlight, the prolongation of the axis of the collimator should cut the centre of the mirror employed for reflecting the sun.

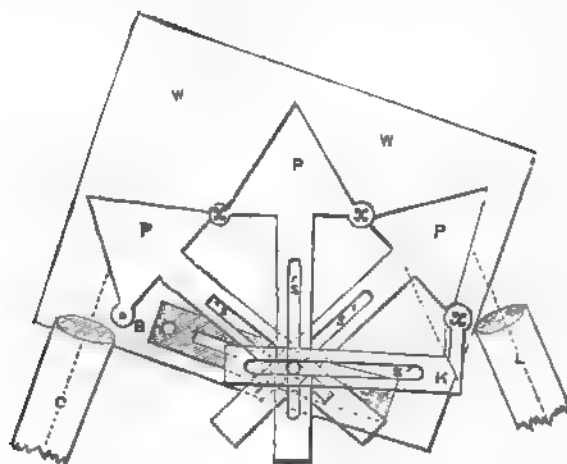
The prisms have next to be put in position. We will suppose that we are to use three prisms, and will proceed to show how they can be placed, so as to give the best possible results. Since the whole possibility of the formation of a spectrum by means of a prism, or prisms, is

dependent on the fact that every different coloured ray is refracted at a different angle by the material composing the prism, it would probably follow that, for the examination of each coloured ray, there is some one position of the prism which is the most favourable; that is, that the coloured ray under consideration should strike the prism at some particular angle, and also emerge from it at some particular angle. Such is the case theoretically and practically; *the angle at which the ray should strike the surface of the prism should be equal to the angle at which it emerges.* It can easily be shown when this condition is not fulfilled that the breadth of the ray is magnified, which in solar spectroscopy might cause the absolute loss of absorption lines, or, at all events, a diminution of their blackness. Granting the truth of this, it will be seen that, if a whole spectrum is to be photographed, only one small portion can be correctly delineated. Practically it is found that one-eighth of the spectrum may be photographed without any appreciable loss, since the angular deviation from the mean ray of all the rays lying within that portion is very small. This, however, may throw some light on the inefficiency of spectroscopes in which the dispersing prisms occupy a fixed position as regards the incident light.

In order to place the prism in position some artifice must be adopted to secure the equality of the angles of incidence and of emergence for the ray occupying the mean position of the position of the spectrum to be photographed. Place the centre of one of the faces of the prism in a line with the axis of the collimator, adjusting the height of the slab, if necessary, by means of the screws on which it rests. Place the eye at a distance from the adjacent surface to catch the spectrum thrown, and gently turn the prism, noting the ray for which it is to be adjusted. It will be found that by turning the prism in one direction the ray will appear to travel in the same direction for a while, and then move back in the opposite direction. The position of the prism where the ray appears to alter its motion is the position required. It then travels in what is known as the *angle of minimum deviation*. The next prism may be placed behind the first, and the same operation continued till its position is fixed, and so on for the other prisms. This method of adjusting the prisms is effective for the brightest parts of the spectrum, but when it is desired to photograph the faint violet, or the invisible rays, of necessity it fails. We must then fall back on an automatic adjustment, such as that which was brought out by Browning in an incomplete form, and perfected by Proctor. The apparatus described, of course, is not to be made of the material or with the workmanship that an instrument-maker would expend upon it. The material required for our purpose is some stiff cardboard (the glazed card used for stereoscopic pictures answers admirably), a smoothly-planed board, a few pins, a common round-headed screw, some tacks, and thread; and all the workmanship necessary can be performed by a penknife, parallel rulers, a pair of compasses, and a scale. The figure (next page) gives a general idea of what is to be made.

Cut out three figures in the card of the shape of *P*, making the base of triangular portion slightly larger than the base of the largest prism (it being supposed that the angles at the vertices of the prisms are equal). Cut slots (*S*) in the arm of *P* of such a width as just to fit the shank of a half-inch screw. Fasten the corner *B* to a board, and connect the other corners *X* together by pins, but not to the board, and then place the screw through all the slots as shown. It is convenient to have an extra piece *K*, the distance from the centre of the cross-piece to *X* being exactly half the base of the triangular portion of *P*. Finally, cut a piece of card shown by the shaded lines, in which a slot of equal width to *S* is made. The board *W* must be counter-sunk beneath the slot in the shaded piece of cardboard, so as to allow the admission of the head of the screw. The central line of the slot, if prolonged, must

out the pin B. The automatic arrangement is now complete. When K is moved the shank of the screw runs along the slots, and it will be seen that the base of each successive triangular part of P commencing from the point B moves through double the angle of the preceding one, which is the problem that had to be solved. In order, however,



that the proper angle should be maintained for the incident light, it is necessary that the axis of the collimator E should be at right angles to the slot in the shaded card. The axis of the camera lens should also be maintained parallel to the dotted line which joins the point indicated in K and the centre of the base of the nearest triangular portion. By a little skill the different cards PPP may be raised to the same level, and the prisms be placed on them. Another method of utilizing this movement is to make T pieces of PPP. Cut away all the board W except that necessary to hold the shaded card, and apply the straight edges of the cross parts of the T's to the bases of the prisms when set on the smooth slab.

THE GELATINO-BROMIDE PROCESS.*

[We publish this resumé of the process, taken from a French manual just published, in the hope that it may be welcome to many who have seen the charming examples produced by its means, now exhibited in Pall Mall.—Ed. P. N.]

The employment of gelatine as a substitute for collodion in coating photographic plates is not a new idea, and, since 1854, an English amateur sensitized in a silver bath a film of iodized gelatine, which he exposed in a moist condition and developed with an iron solution. Taking up this idea, Dr. Maddox published, in 1871, some experiments made by him to substitute gelatine for collodion in emulsions.

Since that time, and especially in 1874, the process has been completed by Messrs. King, Bolton, Fox, Mawdsley, Stuart Wortley, Kennett, and Palmer, and to such a degree has the method been perfected that if we were not daily experiencing progress in art and science, one might almost say that, from a landscape photographer's point of view, the last word has been said in photography.

Messrs. King and Kennett deserve especial mention in the part they have taken in this matter, for they have resolved the difficult problem of easily preparing the material upon which the process is based, of which I desire to say something; they have also been successful in drying the product so as not only to secure it in a very portable form, but in a state in which it can be well preserved and easily employed. Thanks to them, it is possible to carry it in

small quantities, even upon a long voyage, the sensitized gelatine only requiring for its final preparation a little warm water, the material thus furnished being capable of application to glass plates so as to furnish films possessed of sensitiveness equal to that of wet collodion, and of such a nature as to give impressions having the most delicate details.

The preparation of gelatino-bromide or gelatine containing bromide of silver presents some great difficulties, for it is indispensable that the emulsion destined for covering the glass should be composed exclusively of gelatine and bromide of silver. As soon as one mixes the gelatine, the nitrate of silver, and bromide of potassium, the nitrate and the bromide, both soluble in water, yields (by double decomposition) bromide of silver, a salt insoluble in water, and which sensitizes the gelatine and nitrate of potash. The latter must be eliminated, because it would otherwise crystallize upon the film, and act injuriously.

To eliminate this nitrate of potash two methods have been suggested. The first, applied in the first case by Mr. King, in the preparation of gelatino-bromide, is based upon the property of parchment and other analogous bodies to filter salts (crystalloids), and retain gelatine (colloids). To eliminate the nitrate of potash, Mr. King places in a vessel covered with a parchment diaphragm the gelatine mixture that contains bromide of potassium and nitrate of silver; the vessel is then reversed, so that the parchment top becomes the bottom, and put into a dish of warm water. Permitted to remain for a few hours in this position, the gelatine becomes isolated, together with the bromide of silver, which is insoluble in water, while the nitrate of potash and excess of nitrate of silver (both being soluble) pass through the parchment diaphragm into the water below. This process of dialysis, which is very simple, permits everybody to prepare the bromized gelatine or himself.

Mr. Kennett eliminates the nitrate of potash by simple washing in cold water several times repeated.

The preparation of gelatino-bromide being, however, an operation of some delicacy, and the gelatine solution possessing but inferior keeping qualities, the process did not come into general use until Mr. Kennett discovered the means, which has been protected by a patent, of drying, and thus preserving for an indefinite period, the sensitized gelatine. The sensitized pellicle Mr. Kennett prepares with considerable care, and the material may be relied upon far more than the collodions and dry plates produced by certain French manufacturers.

The advantages of the gelatino-bromide process are very numerous, and its superiority as a sensitive film is incontestable. The few defects to which it is liable are to be easily avoided. The cleaning and finishing of the plates, the first so delicate, and the second so long and laborious, an operation in most processes, are in this one of extreme simplicity. To clean the glass it suffices, after having washed the plate, to rub it with a linen rag and a little dry tripoli powder, then to pass over it a brush, and to apply the emulsion; a washing with warm water is then all that is necessary.

Instead of the process of collodionizing, an operation often of difficulty, especially with beginners, when a large surface has to be covered, there is nothing to do beyond making a pool of the emulsion in the middle of the plate, and spreading the liquid with a strip of glass, or even with the finger. This emulsion, which takes the place of sensitized collodion, avoids the use of baths, washings, &c.; the film that is applied to the plate adheres very perfectly, and does not become detached on development, while varnishing at the end is rendered altogether unnecessary. Moreover, the contact of the fingers with the film produces no spots or stains, as would be the case with a collodionized surface.

The sensitiveness of gelatino-bromide being very great,

* Extract from a work just published by M. Odéot.

its exposure in the camera should be short, a few seconds being given instead of the few minutes usually requisite in the case of dry plates. This is a great advantage, and one which tourists especially will appreciate, for everyone knows with what rapidity the light alters in mountainous districts, especially at a certain height above the level of the sea.

Green foliage is rendered especially well by the gelatino-bromide film, which reproduces also with accuracy the fine points of distance seen on the horizon in a landscape picture.

Its development is rapid, and it is, moreover, economical to use. There is no employment of ether in the process, the vapours of which are well known to be unhealthy, if not dangerous.

PHOTOGRAPHIC ENAMELS AND VITRIFIED PHOTOGRAPHS.

BY M. L. A. POITEVIN.*

I WAS not the first to produce photographic enamels, for they were made long before 1860, but by a process which to this day is unknown, or which has, at any rate, never been clearly or entirely described by its author.

The possibility of obtaining photographic impressions in powdered pigments of any kind permitted me to fix by fusion photographs upon glass for windows, and also upon plates of enamel, and subsequently I worked out the following *modus operandi*.

1. To obtain vitrines, or photographs upon glass suitable for windows, I prepare the glass first of all with a mixture of perchloride of iron and tartaric acid, as in the manner described in my paper upon printing by means of pigment powders. I expose the plate thus prepared under a cliché, and develop the image with fusible colours or coloured oxides, covering the same with a light coating of flux before passing the image into the muffle furnace. Instead of operating directly upon the glass plate where the image should be fixed, I can also operate upon the glass as in the ordinary carbon process; then I transfer the image with a film of collodion, and place it upon a glass plate, where it is fixed in the furnace.

To operate upon curved enamels, I always obtain the impression upon a ground glass surface by means of a sensitive film of perchloride of iron and tartaric acid, and I then develop by the powder process with fusible pigments. The surface is then covered with collodion, and I wash first with ordinary water, and then with acidulated water, to remove the sensitive preparation; a moistened sheet of paper is applied, and the image lifted off by its means. The paper is cut to the size of the enamel plate, which is placed in a bath of sugar and water—

Sugar	...	...	...	...	4 parts
Water	...	...	...	...	100 "

The collodion film is immersed in this bath, and then placed upon the enamel, care being taken to ensure contact, and the whole is then dried spontaneously.

Before passing the enamel and image into the muffle furnace, it is necessary to destroy the film of collodion, which will not be annihilated by the fire without affecting the image. I do this at first. With this object in view, I plunge the enamel in concentrated sulphuric acid, and after a few minutes' treatment withdraw the image and wash it first in ordinary water and subsequently in distilled. I permit the enamel to dry again before putting it into the muffle furnace. To avoid this treatment with sulphuric acid, which dissolves the collodion, but which may also modify certain of the colours or fusible pigments, the operator may, instead of putting the image in powder in direct contact with the surface of the enamel, place it in such a fashion that the collodion is in contact, and that the powdered pigments are above. In this way, after spontaneous desiccation, the enamel may be put into the muffle furnace

without any fear being entertained of an alteration of the image.

This process, the principle and mode of operation of which belong to me, and was practised by myself personally in Paris, has been taught under my direction to a large number of pupils who are now practising it in various countries.

[It is a pity, we think, seeing that M. Poitevin claims to be wholly and solely the inventor of this process, and speaks of having spread it throughout Europe, that he does not make known more practical details concerning enamel photography. All those who have experimented in this direction know that the operations are particularly delicate and time-taking, and in this country, at least, those who practise the art most successfully have had to work it out for themselves. The details here furnished by M. Poitevin are nothing more than a theoretical sketch of the process.—Ed. P.N.]

NEW PROCESS FOR ELECTRO-PLATING.

PROFESSOR A. W. WRIGHT, of Yale College, New Haven, Conn., has discovered a new and brilliant method of electroplating, which promises to be of great utility. Taking advantage of the fact that the various metals may be volatilized by the electrical current, he provides a hollow vessel, from which the air is partially exhausted; within this vessel he arranges opposite to each other the two poles of an induction coil; the article to be electro-plated—a bit of glass, for example—is suspended between the poles; to the negative pole is attached a small piece of the metal that is to be deposited on the glass. From three to six pint Grove cells are employed, yielding, by means of the induction coil, an electrical spark from two to three inches in length. Under the influence of this spark a portion of the metal of the electrode is converted into gas or volatilized, and condenses upon the cooler surface of the suspended glass, forming a most brilliant and uniform deposit. The thickness of the plating thus produced may be regulated at will, by simply continuing the action of the electricity for a longer or shorter period. That the metal is actually volatilized is proven by examination with the spectroscope during the progress of the operation, the characteristic lines of whatever metal is used for the electrode being fully revealed. This may be classed as the discovery of a new art, and is certainly very interesting and remarkable. In brief, it consists in plating the surfaces of substances with metals, by exposing such surfaces to the hot vapors of whatever metal it is desired to plate with.

Professor Wright has already made a number of valuable practical applications of his discovery. He produces mirrors with silver, platinum, iron, and other metals, of the most pure and resplendent character. He deposits gold in a layer so thin that it is only 0.000183 mm. in thickness, or approximately only one-fourth the wave length of a red ray of light. He obtains curious colors in the metals, varying with the thickness of the deposits, and opens up a new field for investigation into the nature of metals and other volatilizable substances, and perhaps of light. He shows that his electrically deposited metals have improved qualities; that telescopic and heliostatic mirrors, for example, of platinum deposited on silver, by his process, will be unalterable; and the promise is that we shall before long be able by this new art to produce telescopes and other scientific instruments of greatly improved character.—*Scientific American*.

Correspondence.

CERAMIC PHOTOGRAPHY.

SIR,—A few weeks ago you published the specification of a ceramic process patented last year. The literature of ceramic photography is very meagre, and certainly the publication of the above would not do much to unveil the hidden mysteries of the art.

The other day I saw, for the first time, Mr. J. Thompson's translation of Gustavé Tiersandier's "History and Hand-book of Photography." He devotes a chapter to photographic enamels, and in speaking of Lafon de Camarsac's contributions on the above subject, in a foot-note he refers to patents taken out by Camarsac in 1874. Camarsac's method has never been made known so far as I know—I mean in detail.

I, along with many others, would be very much gratified if your French Correspondent, who has been so vigilant in obtaining and transmitting all that was new and important that took place on the other side of the Channel, would give us a translation of Camarsac's specification of his patents of 1874.

Have I overlooked any notice of the above? I am not aware of it ever being taken notice of in the News. I am always on the look-out for Lacan's articles. *ENAMEL.*

[We shall be glad if Mons. Lacan can favour our readers with the information in question. We have not seen, and were not aware of, any patent obtained by M. Lafon so recently. Regarding specifications of ceramic photography, we have often noted that when a patentee has nothing new to communicate, or wishes to avoid communicating anything, he resorts to unmeaning jargon.—ED.]

REPRODUCING PLANS.

DEAR SIR,—In the last issue of your valuable paper you give an account of your experiments with the view to produce negatives of maps, plans, and ordinary photographs on paper, by means of the sensitive tissue printed in contact through the paper. I noticed some observations made respecting development, &c., on which a little light will be useful to persons trying similar experiments.

It is true that, by long exposure and careful development, negatives can be produced showing no trace of the texture of the paper; but I found that some sorts of paper had such coarse texture as to be totally unsuitable for the purpose. Thickness of the paper is not the objection, because a little longer exposure will readily overcome this obstacle. An example is furnished in the paper of ordnance maps, which, though very stout, has no texture. Among the albumenised papers on which ordinary photographs are printed, Saxe is generally much better than Rives. When the negative is to be made from the print on very coarse paper, I find it advantageous to put two or three sheets of ordinary paper in front.

You succeeded in using ordinary developer, notwithstanding very long exposure given. I recommend in the cases under consideration a modified developer, viz., containing more restraining bromide and less proportion of ammonia carbonate and pyrogallie acid. This I do with the double view to render coming of the image slower, and to secure to the developed image certain colour.

Persons familiar with the development of the tissue negatives, could not but have observed that when an ordinarily well-exposed negative is developed, the appearance of the image under the action of developer proceeded gradually, showing first the objects highly illuminated, till at last the darkest parts acquire the necessary amount of details; density following same way equally gradually.

To make my description intelligible, I may state that the appearance of the image is totally unlike that often observed when the image appears in all its details, almost imperceptible at first, and acquiring density all over, as if by a second stage. I shall be still clearer if I say that in the case of landscape negatives clouds will come first, and the operator can, by suddenly stopping development, secure perfect negatives of clouds before any, or scarcely any, of the terrestrial objects are perceptible. This quality must be utilized when negatives are made by contact printing through the paper prints. The absence of reflecting and refracting elements (which are causes of failures when glass plates are used) permit of any exposure above absolutely necessary.

In development the image will gradually pass through all the stages. Success and quality of the result depend entirely upon the choice of the proper moment when development is to be stopped. A weaker and more restrained developer will cause the appearance of the image to be slow, and this is my reason for recommending it, in order to give time to the operator to form his judgment, and stop the development without hurry.

The colour of the developed image depends on two conditions: time of exposure, and proportions of developing solutions. Long exposure and weak developer produce warm coloured image, gradually changing with variation of these elements.

Transparencies, either for magic lantern or otherwise, can be made of that warm tone so much superior to the generally grey colour unavoidably resulting when wet collodion process is used. The density of the image can also be regulated by varying the developer, and it is in direct proportion to the quantity of pyrogallie acid used in the developer.

I conclude my remarks by giving the formula for developer, appropriate to different requirements, I use at present:—

- A. Saturated solution of carbonate of ammonia.
- B. Potassium bromide, sixty grains, water one ounce.
- P. Pyrogallie acid, sixty grains, methylated alcohol, one ounce.

	For short exposures in the camera.	For full exposure in the camera.	For long exposure in the printing-frame.
A.	$\frac{1}{2}$ ounce ...	10 drops ...	1 to 20 drops
B.	10 drops ...	10 drops ...	10 to 20 drops
P.	20 to 40 drops ...	10 drops ...	1 to 20 drops
Water	— ...	$\frac{1}{2}$ ounce ...	$\frac{1}{2}$ ounce

I am, &c.,

L. WARNERKE.

FADING OF SILVER PRINTS.

SIR,—May I ask, through your columns, the favour of contributions exemplifying "the fading of silver prints?" I am anxious to obtain a few good examples—of which the history is known—to aid me in some investigations regarding the cause of it.—Yours faithfully,

W. DE W. ARNET, CAPT. R.E.

South Kensington Museum.

P.S.—Unmounted prints would be the most suitable.

Proceedings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Thursday evening, the 11th inst., the President, Mr. A. BAUTHERS, F.R.A.S., in the chair.

The minutes of the May and September meetings were read and confirmed.

The President then read the

Annual Report.

"In presenting the annual report of the session just closed, your Council consider it their first duty to express their sincere regret at the death of Mr. J. H. Young, who had for many years been the much respected Treasurer of the Society. Mr. Young's invariable courtesy and business ability ensured for him the respect and friendship of every member of the Society with whom he came in contact, and his genial presence will be greatly missed. The balance sheet prepared by the Auditors will be presented for your acceptance. The Society may be said to be fairly prosperous. There are at present seventy members on the books, against sixty-eight in the previous session. The attendance at the meetings shows a slight increase—twenty-nine and a half against twenty-eight which is probably due to the gastronomic entertainment in March. Papers for discussion are becoming increasingly difficult to obtain, and consequently the record of last year's efforts in that respect are unsatisfactory. In other respects the meetings have not suffered for want of both attractive and interesting subject. You have had a paper from the Rev. Canon Beechey, M.A., ex-President, 'On Beechey Dry

Plates. One by Mr. Noton, 'On the Production of Back Pressure in the Oxygen Machine,' with practical illustrations. One by M. W. J. Chadwick, 'On a New Form of Oxygen Generator,' when the machine was exhibited in action. Mr. Noton followed with a short description and exhibition of another new oxygen machine, and Mr. D. Young with a communication on the same subject. Mr. Pollitt read a paper 'On Swing Front- versus Swing Backs.' Your Council once more request the members to bring all they can, in the shape of failures or anything else, to the monthly meetings. The object of the Society is not display. The cause of every success or non-success is, or ought to be, the pursuit of every member, and one of the ways to that end is to show examples at the meetings, so as to elicit by discussion the why and the wherefore, as far as possible, of everything photographic.

The annual report was adopted, after which the Treasurer's accounts were considered and passed.

Mr. J. H. Galloway and Mr. George A. Brooks were elected members of the Society.

The election of officers for the ensuing year was then proceeded with, and resulted in the following elections:—

President—Alfred Brothers, F.R.A.S.

Vice-Presidents—Rev. Canon Beechey, M.A., Thos. Haywood, G. T. Lund, M. Noton, I. Wade.

Council—A. Coventry, J. T. Chapman, W. J. Chadwick, J. W. Leigh, John Pollitt, J. B. Payne, J. C. Sowell, W. Stevenson, John Warburton, N. Wright.

Treasurer—W. G. Coots.

Hon. Sec.—Chas. Adin, Clifton Bank, Wellington Road, Whalley Range, Manchester.

During the examination of the voting-papers Mr. Chadwick exhibited some excellent prints from emulsion negatives, by Mr. Woodbury. He (Mr. U.) also exhibited and experimented with a little apparatus for lighting gas jets by electricity.

Mr. Lizon showed several collodio-albumen negatives which had received much shorter exposures than such plates are generally supposed to require. One of these negatives had received an exposure of only forty seconds, one afternoon early in September. This was a fair negative, but somewhat under-exposed.

Messrs. A. Brothers, W. G. Coots, G. T. Lund, N. Wright, and I. Wade, together with the Secretary, were appointed a sub-committee to revise the rules.

The usual complimentary votes were passed, and the meeting was adjourned.

Talk in the Studio.

THE COLLISION OF THE "AVALANCHE" AND THE "FOREST."
—In recording the proceedings of a public meeting held in Portland a few days ago for the purpose of distributing awards to the crews that went to the rescue of the survivors in this collision, the *Daily News* says:—"Some gentleman who had witnessed the occurrence of the gallant launching and beaching of the boats had made a very spirited sketch; a beautiful photograph of this had, as his contribution to the reward of bravery, been executed by Mr. Debenham, of Weymouth, and a copy of this photograph was presented to each of the men, framed with the following address:—'Presented to (here was inserted the man's name) one of the members of the two crews of the *Portland Levette*, who, at the risk of their own lives, launched their boats from the Cheal Beach on the morning of Wednesday, September 12, 1877, and rescued the sole survivors of the *Forest* and *Avalanche*, which ships had been destroyed by a collision in the Channel the previous night. "Such noble acts of devotion and self-sacrifice in the cause of humanity are surely noted in the Book of Life." This was accompanied by a share of the public subscription made in answer to an appeal by the Rev. J. A. Braser, Rector of Portland. A list of the names of the contributors is placed at the back."

EXPERIMENTAL COMPOSITION OF LIGHT.—William Terrill arranges seven lanterns, with glass slides stained to imitate the different colours of the spectrum. By turning the lanterns so that the projected circles overlap, a circle of white light is produced. Interesting experiments with complementary colours may be performed in the same way.—*Nature*.

FADING OF CARBON PRINTS.—A very important question—that of the permanency of carbon prints, and which some time ago gave rise to some doubt; in England—was alluded to at one of the meetings of the Belgian Association at Brussels.

Mr. Garuzet placed before his colleagues prints that had remained for two years and a half in full light, and that had lost nothing of their quality. The general tone had lowered, but uniformly without any change in the half tones, as would have happened to prints made with silver salts under the same conditions.—*Photographic Times*.

HINTS ABOUT GLUE.—Good glue should be a light-brown colour, semi-transparent, and free from waves or cloudy lines. Glue loses much of its strength by frequent re-melting; therefore glue which is newly made is preferable to that which has been re-boiled. The hotter the glue the more force it will exert in keeping the joined parts glued together. In all large and long joints it should be applied immediately after boiling. Apply pressure until it is set or hardened.

To Correspondents.

AMATIGLON.—For ferrotypes we should prefer a light gray background for general use. If the background is too dark, a ferrotype is apt to look heavy.

BAKRYTA.—The question as to the relative advantages of stippling and hatching in retouching negatives is very much a matter of taste and of the effort desired to be produced. Stippling is more suited for exceedingly fine and delicate work, hatching for bolder effects. Of course, in either case, it must be done with care, so as to harmonize with the contour of the face. If you study the articles on retouching which have appeared in our pages, or the works which have been published on the subject, you will obtain valuable hints on the subject about which you inquire. The work of Messrs. Burrows and Colton, or that of M. Paquet, will give you useful hints; the former being the fullest. 2. We see no advantage, but some mischief in adding nitrate of baryta to an iron developer. Sulphate of copper is thought to act as a gentle restrainer, and to aid the production of a fine deposit.

R. A. N.—The spots in your prints, taken in conjunction with the narrative, are a mystery. There can be no doubt that spots are caused by some foreign body having fallen into the water amongst them; but what, and from whence, it is difficult to conjecture. We have seen similar spots produced by chloride of lime, but we do not see how that could have reached your print. Enquiry and examination on the spot are, we fear, the only means you have of ascertaining the cause.

J. McCULLOCH.—Adam-Salomon's eucastic paste was prepared as follows:—

Pure white wax	...	...	...	1 ounce
Gum elemi	...	...	...	10 grains
Benzole	...	...	...	200 minims
Essence of lavender	...	...	...	300 "
Oil of spike	...	...	...	15 "

Mix, and melt on a water bath; and strain whilst warm.

X. X.—Marion & Co. are the manufacturers of the ferro-prussiate paper. We do not know what fixing material they use. Gelatine or gum tragacanth would probably answer well, especially the latter.

C. J. F.—The stains are caused by hyposulphite of soda. Your blinding-paper has been probably touched at some time with traces of this salt.

ALEX. DINNIE.—Imperfect washing between toning and fixing very often causes a decomposition in the hypo. solution, liberating sulphur and endangering the permanency of the print.

ERNEST E. WHITE.—The tarum sal soda is commonly used in America, and was at one time in this country, to indicate common carbonate of soda or washing soda. A toning bath may be made by the addition of a few grains of this salt to a grain of chloride of gold and the due proportion of water. It has, however, serious disadvantages: the bath does not keep, but must be used within an hour. If used too soon it bleaches the prints, and gives a granular mealy texture; if delayed too long it won't tone at all.

H. F. FARMER.—The work is very good indeed, allowing for difficulties of lighting. So far as we can judge by this work, we should say you might hope for a situation in a first-class establishment.

ENTHUSIAST.—The clotted character of your emulsion is due to the use of an unsuitable sample of pyroxyline. You require a sample of what is termed the more powdery character, made with weak acids at a high temperature. No filtration will effectually remedy the matter. There are collodion filters made, but you may manage to filter by plugging a funnel with a piece of cotton wool (jeweller's cotton will generally answer); push the wool gently and lightly into the neck of the funnel, and place a piece of glass over the top to prevent excessive evaporation. Your real remedy is a more suitable sample of soluble cotton or of collodion.

Several Correspondents in our next.

The Photographic News, October 26, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE COLLODION AND GELATINE EMULSION PROCESSES—BLUE, VIOLET, RED, AND YELLOW LIGHTS FOR THE STUDIO.

The Collodion and Gelatine Emulsion Processes.—Our object just now is not to point to a dry process which gives plates quite as sensitive as wet ones, for every dry process does that. In truth, dry plates, to hear their producers talk of them, seem long ago to have left dark tent and silver bath in the lurch, and it is only when it comes practically to employing the camera that these good people condescend to have recourse to the old-fashioned methods of manipulating. "The films I prepare," says our friend, "do not require a full second's exposure in a good light, they are so exquisitely sensitive; only, if you like, you can, of course, give them twenty minutes, and then you get a very fine result indeed." Now it is a pity to talk in this fashion, especially when some of our modern dry processes are really so excellent that they do not require bolstering. We do not suppose that any photographer whose reputation depended on his work, and who had but a single opportunity before him, would turn his back upon a wet plate if it were offered him, let him be ever so much a believer in dry films; but, on the contrary, he would much prefer to employ moist collodion, if facilities existed for so doing. At the same time, none will deny the extreme importance of dry plate photography, and it is curious to note how, during the past year or two, the preparation of dry films has been pursued in two different channels comparatively unknown not many years ago. Collodion emulsion and gelatine emulsion have both their ardent advocates now-a-days, and it would be difficult to say, with so many charming results before us, to which should be awarded the palm of merit. In so far as sensitiveness is concerned, we shall say nothing. "My father is richer than your father," is an argument we have often heard discussed at schools, but it was one which we never heard satisfactorily solved. The data brought forward was obviously so prejudiced on one side or the other, that it was impossible to regard the statements in any other light than as efforts of imagination upon the part of the disputants. So it is with the collodion and gelatine emulsions, to my mind. A gelatine plate requires, we will say, six seconds' exposure, and one prepared with collodion emulsion half-a-dozen, and there we will let the matter rest. The manipulations are pretty well the same in both cases. A little warm water may be required to dissolve the gelatine pellicle prior to use, but then, on the other hand, you can keep your material dry till wanted, and, moreover, you need not have your glass so clean and polished to receive the gelatine. On the latter point there may be some slight advantage, possibly, in the fact that even the finger may be used for spreading the emulsion on the plate, whereas, in the case of the collodion material, such a method of going to work would infallibly produce stains and patches in the image. As to the results in the two cases there is not a pin to choose between them. Both gelatine and collodion emulsion will produce pictures equal to anything that has ever been done in photography, at any rate so far as landscape work is concerned. Let any one look round the exhibition in Pall Mall, and examine the delicate porcelain-like pictures which represent the two processes. Many of the prints possess that character which we used to admire so in Russell Manners Gordon's photographs. Delicacy and detail are the main features, and these are secured without the sacrifice of vigour. In respect to the actual preparation of the two emulsions we can say little from personal experience. Our only attempt to make collodio-bromide emulsion was done some time ago, and we caused a scientific photographer to laugh heartily the other day when he heard our haphazard

method of proceeding. It was simply to sensitize some collodion plates in the ordinary way, and on their coming out of the bath to scrape off the film with a bone spatula, put it into a bottle, and redissolve it in alcohol and ether. It was a wasteful manner of proceeding, and the emulsion when produced was not very good, but the material satisfied the exigencies of our experiment, and its preparation in this manner took up but a few minutes. But photographers, unless they are large consumers, will not, we think, prepare their own emulsion. The modes of preparation as laid down on the subject are not very complicated, it is true, but in both cases there is one special feature which requires particular care and takes time. In the collodion emulsion the adding of the silver by degrees, and under constant agitation, is the one point; and the removal of the superfluous salts from the prepared gelatine, whether this is done by dialysis or by repeated washing, is the other. In these columns we have repeatedly given details of the preparation of both kinds of emulsion, and from time to time have referred to the improvements which have been suggested by such men as Davanne, Andra, and others. In Paris just now the collodio-bromide is becoming quite the rage, ever since Chardon took the prize of 500 francs for the best dry plate process at the beginning of the year; and we should not be surprised if our friends across the water one of these days claim the method as an invention of their own. In Germany the gelatine process has many advocates, but, as we have said before, they are both excellent methods, and capable of yielding exquisite results.

Blue, Violet, Red, and Yellow Light for the Studio.—It was Constant-Delessert, we believe, who was the first to suggest rose-coloured light for the studio; blue glass, of course, was proposed years and years ago; while to M. Scotellari belongs the credit of having mentioned violet illumination as appropriate to the photographer's atelier. Lately another suggestion has come in—to have glass tinted a pale bright yellow. Really all the colours will be used up before we can come in with a suggestion: a fashionable crimson, trimmed with the green that is so much worn just now; we beg pardon, of course a studio is not a lady's dress. No, parti-coloured or rainbow-tinted glass is what we propose. In this way the model will appear in all the most lovely shades, and the exposure will be just one half that required under ordinary circumstances, when, say, the lens is used in white light with the smallest stop. We should mention that in this calculation we allow for no stop at all with the rainbow lights. We hope nobody will regard our suggestion otherwise than seriously, or at any rate with less reverence than has attended the previous suggestions to employ rose, blue, violet, and yellow colours. We can defend our plan quite as readily upon scientific grounds as any of our fellow-inventors, among whom, we think, he who suggested bright-yellow has made the happiest suggestion, since the golden sunlight has certainly something of the yellow about it. M. Scotellari, we hear, is in this country just now trying to secure converts to his method of thinking, and to all appearances he is getting on very well. If many do not actually believe in the efficacy of his violet light, there are several quite ready to bear testimony to some clever methods he has introduced for the purpose of shortening exposures; indeed he seems to have made lighting the sitter his especial study, and has at his fingers' ends many plans and contrivances such as could only have been devised by a clever and experienced photographer.

THE PHOTOGRAPHIC EXHIBITION.

[From NATURE.]

The Photographic Exhibition, which is now open at 5A, Pall Mall East, is well worthy of a visit by all lovers of the art-science, exemplifying as it does the progress that has been made in dry plate processes. The perfecting of these processes must have a marked effect on the future of photography, as when they are

capable of being employed under all circumstances the heavy paraphernalia attendant on the wet process may be consigned to the lumber-room, and the worker in the field or laboratory need only be dependent on his box of sensitive plates and his camera. We cannot enumerate all the processes, examples of which are exhibited. We may mention, however, that the simple bromide of silver emulsion, either held on the plate embedded in collodion or gelatine, appears to bear away the palm for excellence, unless it be the process with which Mr. England has produced his splendid collection of Swiss views, in which (though no information is given in the catalogue regarding it) we think we can trace the delicacy due to albumen in the sensitive film, combined probably in some way or another with bromide of silver. Another feature of the exhibition are the enlargements which are shown by various exhibitors, amongst whom we may name, as being specially worthy of mention, the Woodbury Company, the Royal Engineers, and the Autotype Company. The enlargements taken by Mr. E. Viles with the microscope are also worthy of more than a passing remark. They are all beautifully executed, but perhaps the picture of the proboscis of the common blow-fly should be specially singled out, being almost perfectly enlarged to two hundred diameters. We believe that a comparatively low-power objective was employed, and that from the small negative obtained by it an enlargement in Mörchhoven's solar camera was produced. These pictures are hung too high to be well seen, and Mr. Viles perhaps might be persuaded to show them at some of this season's scientific soirées. As regards the application of photography to scientific purposes there are no other examples to be found in the exhibition, a matter which we deeply regret, seeing the large use that is made of the art-science in nearly every investigation of the present day. As regards the artistic element present, it is not in our province to dwell upon it. In many examples of portraiture it would have been well had that abomination—retouching of the negative—been avoided. As showing what a grand pencil is sunlight to the artist, we may mention the exhibits of Robinson, Blanchard, Mrs. H. Roscoe, and Slingsby, in all of which are to be found true artistic feeling and perfect manipulation. The works of Payne-Jennings, Bowness, the Royal Engineers, Stephen Thompson, and England may be classed amongst the best of the landscape work.

Amongst technical work we have examples of a capital photo-relief process by Warnerke, by which an artist's own drawing can be faithfully reproduced as a block for surface printing. The mechanical printing processes from gelatine are also admirably represented by the Autotype Company, as is that known as Woodburytype.

This notice would be incomplete without calling attention to the photographs taken during the recent Arctic expedition under Sir G. Nares, which have been exhibited by the Admiralty, and also to those taken by Mr. Grant, who accompanied Sir Allan Young in the *Pandora*. Both sets of photographs are very good when the difficulties under which they were taken are considered.

From the TIMES.

The Photographic Society of Great Britain has collected this year, at 5A, Pall Mall East, a large number of good specimens of photography. One or two of the best English photographic artists are conspicuous by their absence; but the show is on the whole a remarkable illustration of the progress of an art which only dates from 1839. Niepce, the French scene-painter, and the better-known inventors, Talbot and Daguerre, had been upon the track for some time; but in that year the detailed proof that the fleeting images in the camera-obscura could be fixed startled the world. Mr. Le Neve Foster has described the wonder and delight with which the mysterious plates produced by M. Daguerre were handed about by scientific people. Shortly afterwards the late Mr. Fox Talbot publicly exhibited his photogenic drawings, followed by his grand invention of the Talbotype, or, as he named it, Calotype.

The Photographic Exhibition was commenced in 1854; and this year the managers have had, from want of space on their walls and screens, to reject about two hundred pictures. The catalogue numbers run up to 565, but in many cases one entry comprehends several pictures. Thus "No. 542, Photographs taken during the Arctic Expedition under Sir G. Nares, lent for exhibition by the Lords of the Admiralty" would in the ordinary way of cataloguing be Nos. 542 to 649, for there are 107 of these Arctic pictures, forming a complete pictorial diary of the last gallant and unsuccessful attempt to reach the Pole. The series begins with a group of natives at Egedes-

minde, in Greenland, and a view of the Expedition at anchor in the harbour of Disco. At Cape York, 76 deg. north latitude, we first see the *Discovery* made fast to the ice. Then comes the ice-foot, Arctic glaciers, and ice worn into beautiful shapes left aground by the falling tide. A view is given of the walrus killed in Franklin Pearce Bay, a fierce sea monster who would have made the fortune of any aquarium if he could have been taken alive. In the winter quarters we are shown young ice, which is black, and other ice, which is hoar, apparently with age. The photograph has preserved for us the theatre, smithy, and skating rink in which the long Arctic night was beguiled. In latitude 81 a seam of coal, twenty-five feet thick, is shown, a striking testimony to the change in the climate since the time when the trees thus fossilized were fed with sap, flourished, and fell. The photographs are creditable to the skill of those who took them, whether by the midnight sun or other light in those high latitudes. As works of art they are inferior to the picturesque views of icebergs and Arctic rocks which Mr. Bradford brought back from a journey to the north in 1869; but they form a faithful record, compiled under great difficulties, of the bleak and desolate scenes in which the least difficult part of the Expedition's task was pursued. There are some other excellent Arctic photographs by Mr. Grant, who went out with Captain Sir Allen Young in the *Pandora*.

From Dantsic, Philadelphia, Lisbon, Algiers, the Cape, New York, Karlsruhe, Switzerland, and Japan, contributions have come to the Exhibition. Dr. Van Monckhoven, of Ghent, has sent some admirable reproductions in photography of old stonework, a branch of art with which photography is peculiarly fitted to deal. Herr Feilner, of Bremen, has a large collection of spirited photographs of actors. Among pictorial photographs an interior by Mr. Robinson, of Tunbridge Wells, in which an old cottager and his wife are represented sitting in their kitchen on a summer evening, at once attracts attention. Photographs of lake scenery by Mr. Bowness; of Mont St. Michel, by Stephen Thompson; of Welsh hills, by Mr. Robert Crawshaw, of Cyfarthfa; and of splendid trees in the park of Knowle, by the Royal Engineers' School of Photography, taken under the direction of Captain Abney, are good examples of the artistic selection of points of view, and the latter of perfect execution. The Autotype Company exhibit a carbon enlargement of a study of Glen Sheire, Inverary, by Mr. Vernon Heath; and Colonel Stuart Wortley has many clever studies of wave and cloud. The use of photography in science is shown by an enlargement to one hundred times its original size of the tongue of the honey bee, made by Mr. Edward Viles. "A Yokohama Belle," by Mr. Valentine Blanchard, is a delightful costume portrait. Sir Thomas Parkyns exhibits "a new process—permanent colours." The mode of producing the photographs is not described. At present the effect is much the same as if an ordinary photograph were printed on toned paper.

Several photographs are exhibited which have been taken on Wernerke's sensitive tissue, a very portable substitute for the glass plate. The negative taken on this material in a hand camera on a tripod, which folds up into an alpenstock, may be sent home by the tourist by post and developed at once into a picture. On the table is a series of vitrified photographs, Hogarth prints, and other pictures transferred to china and baked-in, a process which, if developed, might give us copies of works of high art to gaze upon at the dinner-table. The subject is a tempting one for discussion, but we have not space to do it justice.

A SPIRIT PHOTOGRAPHER WHO COURTS INVESTIGATION.

A WONDERFUL illustration of the ignorant and impudent assumption of some impostors is given in the *New York Sun*, where an interview with a "spirit photographer" is described. The account runs as follows:—

"The visitor to Jay J. Hartman's photograph gallery, at 260 Bowery, is expected to look with awe and faith upon a small negative (quarter size) on which is faintly outlined a shadowy presentment of a woman's face and form. As a ghost the subject is a very presentable sort of person as ghosts run. She seems to be about twenty-six years of age; her hair is smoothed down in a neat and, consequently, un-

fashionable way; her face is suggestive of consumption, and has a resigned, 'not my-faultish' sort of expression. As a truly modest ghost, she wears a very high-necked dress, with a dainty collar. To the sceptical she becomes altogether too vague for contemplation from the waist down; but the eye of faith—that is, of Mr. Hartman—sees an anchor, cherished symbol of hope, in her right hand.

"Mr. Hartman, who is a tall man, with a high forehead, big eyes, and large black whiskers that form an inverted V, said to a reporter for *The Sun*:

"I took this in my private rooms, at 80 Fourth Avenue, on the 14th of August, at half-past nine o'clock p.m., by a flash of lightning. I was all alone—solitary and alone. I prepared the plate in the ordinary way, except that I used certain chemicals not used in common photography, and put it in the camera, which I set in the window, directed upward toward the heavens, at an angle of forty-five degrees. There was nothing visible in front of it but the black night and the storm. Then I drew the slide and unveiled the camera, and when that heavy lightning came this form was taken. You see it stands between two clouds, and here, on this side, is the rain pouring down. Now, I'll back up all about this. I'll prove it to the satisfaction of any three gentlemen for twenty-five dollars apiece. They can furnish their own marked plates and do the work themselves, but the chemicals and the camera I will furnish myself. There's a little secret about the chemicals. They are finer than are ordinarily used. I don't want to say what they are now, because I haven't got this thing down as fine as I want it yet. I think I'm all right on it, but I haven't got it just settled yet. But you see, yourself, ordinary chemicals wouldn't do to photograph by lightning with anyhow—there wouldn't be any harmony, as it were. As for the camera, they can take it all to pieces and see that there's no trick about that, and they may do all the preparing and developing of the plates themselves. I will only put my hands on the outside of the covered camera, and they may search me to see there's no trick. All I want is to put my magnetism in conjunction with the chemicals to act on the reception of the mysterious influences, as you may say. I've been experimenting over a year, but this is the first of the human form that I ever got in this way, and I believe it is the only one in the world.

"Have I ever taken any spirit pictures? Oh, yes! I'm solid on that. I've got a standing challenge for \$1500 that I can produce from one to thirty-five spirit pictures—faces, you know—on a plate, and let people use their own plates and chemicals and camera. I know there was a fraud that pretended to do it exposed in Boston the other day, but I don't fool anybody, and I court investigation. I'm willing to produce spirit pictures in any room that is selected under the conditions I said, and in presence of any one they please. I gave an exhibition in Brooklyn two weeks ago last Friday before some of the finest and most intelligent gentlemen of that city, and produced some beautiful spirit pictures in perfect darkness. I can do the same thing any time, in the dark or the light. A man named Jones came up from Nashville once to expose me when I was in Cincinnati, but I convinced him.

"What do I claim? Well, the atmosphere is made up of live things, or else we couldn't live. There is life in the air as much as in the water, only we can't see it the same; and as I get at these things, this life in the atmosphere is to keep us alive. It's a science, and after I get a little more settled, I'll produce something very fine. I think this is the spirit of something of that kind. You see it's a female face and figure. You can't see the anchor, but I can, because I'm used to seeing things in negatives, and you see she's standing among the clouds, with the rain driving down on this side. I can do more like it. If I couldn't, I wouldn't value the discovery, that is, if I couldn't do it over and over; but you want the right sort of lightning for it. You want a clear, sharp lightning. This common lightning won't do. I'm going to have

Sarony do the printing from this. He can do it better than I can, for he has superior facilities. Then I'm going to get the copies out, with handbills under them offering a challenge. Here's a copy of the handbill I've just written out. I'd read it to you, but I'm afraid I can't, for it's got cold, and I ain't much of a writer. I'm no learned man, but I ain't a fraud."

THE LATE H. FOX TALBOT.

IN the following memoir from the pages of our contemporary, *Nature*, it will be seen that the discoverer of the calotype process was a hard-working student, whose successes were due, not to lucky chance, but were the legitimate result of earnest investigation.

Had the photographic art never been invented, Mr. W. H. Fox Talbot, whose death we recently recorded, would have a claim to take a good rank as a scientific investigator. In the popular estimation his work in connection with photography is what alone gives him a claim to remembrance, but we are sure there are many of our readers who must be familiar with writings by him in various departments of science. He was indeed in many respects a wonderful man, and to glance at the Royal Society Catalogue will show that he has left behind him a great amount of varied work. In mathematics, in physics, in chemistry, in astronomy, in botany, in archaeology, in literature, Fox Talbot at various periods of his life did substantial work, and in addition filled faithfully and liberally the responsible position of an English country gentleman on his estate of Lacock Abbey, Wiltshire.

Fox Talbot was the eldest son of Mr. William Davenport Talbot, his mother being a daughter of the Earl of Lichester. He was born in February, 1800, and received his early education at Harrow. Thence he went to Trinity College, Cambridge, where he gained the Porson Prize in 1820, was Chancellor's Gold Medalist, and graduated in 1821 as Twelfth Wrangler. Just after the passing of the first Reform Bill he sat for two years in Parliament as member for Chippenham, when he retired from public life, and devoted himself almost entirely to work in various departments of science and literature. In the Royal Society's Catalogue alone is a list of about fifty papers by him in various domains of science, and ranging from the year 1822, the year after his graduation, down to 1872. The first paper on the list is a mathematical one contributed to Gergonne's *Ann. Math.* (1822), "On the Properties of a certain Curve drawn from the Equilateral Hyperbola." In 1822-23 he contributed six mathematical papers to the same journal, one of them being "On a Curve the Area of which represent Legendre's Elliptic Functions of the first kind." He was the author of at least eight other mathematical papers contributed to the Royal Society, the *Phil. Trans.*, and the *Transactions of the Royal Society of Edinburgh*. Some of these papers are very remarkable, as those on Definite Integrals, and show Fox Talbot to have been a mathematician of no small power.

He seems to have commenced his researches on light at an early period. There is, for example, in the *Edinburgh Journal of Science*, for 1826, a paper describing "Some Experiments on Coloured Flames," and in the *Quarterly Journal of Science*, for 1827, one "On Monochromatic Light." Other papers in the same direction appear in the *Phil. Mag.*, for 1833, "On a Method of Obtaining Homogenous Light of Great Intensity," "Experiments on Light," 1834, "On the Nature of Light," 1835. In 1861 he published in the *Chemical News* papers on "Early Researches on the Spectra of Artificial Light from Different Sources," and "Some Experiments on Coloured Flames," and so late as 1872 we find, in the *Proceedings of the Royal Society of Edinburgh*, "Notes on Some Anomalous Spectra," "On the Early History of Spectrum Analysis," and "On a New Mode of Observing Certain Spectra."

In chemistry, as might be expected, his researches were many, being mainly connected, however, with photography. One of his earliest chemical papers will be found in the *Phil. Mag.*, ii. 1833, "Remarks on Chemical Changes of Colour." We find other papers contributed mainly to the *Phil. Mag.* on Nitro, Iodide of Silver, Iodide of Mercury, &c.

In January, 1839, Daguerre published his account of his process. On the 31st of the same month Fox Talbot gave an account of his own process to the Royal Society in a paper entitled "Some Account of the Art of Photogenic Drawing, or the process by which Natural Objects may be made to deli-

neate themselves without the aid of the artist's pencil" (*Roy. Soc. Proc.* 1839; *Phil. Mag.* xiv. 1839); and at the meeting of the British Association that year he read a paper on the subject. From that time onwards he continued to write papers in connection with his invention, though for several years before his death he seems to have lost his interest in the subject, and turned his versatile intellect to other lines of enquiry.

The original photogenic drawing is nothing more nor less than the silver printing process of the present day, which has received little or no modifications since it passed out of his hands unless it be the application of albumen to the paper and the fixing with sodium hyposulphite. Early in 1840 a new process due to Talbot created a sensation in scientific circles, the results being a marked advance on everything that up to that time had been produced. This was no other than the Calotype or "beautiful picture process," a patent for which he took out dated 1841. The main features of this process may be described as the production of a photographic picture on sensitized silver iodide, held *in situ* in the pores of paper, and its development by means of gallic acid. The credit of the discovery of this method of development has often been ascribed to Fox Talbot; but we believe that to the Rev. B. J. Reade it is really due, but was so modified by Fox Talbot as to render it manageable in the hands of the operator. The next patent that Fox Talbot took out was registered under the title of "Improvements in Calotype," in which, amongst other things, he included fixing the photographic image on the paper by means of sodium hyposulphite, a solvent for the haloid salts of silver which Sir John Herschel had used in February, 1840.

The third patent taken out by Talbot, in conjunction with Malone, was for the use of unglazed porcelain in lieu of glass, on which to support the photographic image, using an albumen process. In this patent also we have a protection granted for an invention which has several times since been rediscovered, viz., the use of a transparent and flexible support in lieu of glass capable of being adapted to a curved surface, by which means a panoramic view might be taken in the camera by the gradual rotation of the lens round its optical centre. This flexible support was paper rendered transparent and non-absorbent of the liquid albumen applied to its surface. The last novelty included consisted of an application of photography to the production of an image on steel plates, doubtless with a view of helping the engraver.

The fourth patent was for a process (described in the *Athenæum*, December 6th, 1851) by which instantaneous pictures could be taken, and was so sensitive that an experiment undertaken at the Royal Institution to prove its value is worthy of redescription. Printed matter was fixed on a wheel which was caused to revolve at a rapid rate, and being illuminated by the spark from a battery of Leyden jars, a facsimile of it was produced in the camera, "every letter being perfectly distinct." We doubt if at the present day any greater degree of instantaneity could be secured even by the most rapid collodion processes extant. The success of the process was due to the extreme sensitiveness of silver iodide when prepared by double decomposition of the iron salt, and also to the great facility with which silver nitrate could be reduced by ferrous sulphate. The debt he owed to Dr. Woods, of Parsonstown, and to Robert Hunt, who respectively discovered these facts, Talbot duly acknowledged in his communication to the *Athenæum*.

The last patented invention in photography with which Fox Talbot's name is connected was that of photographic engraving. This process is based on the discovery by Poitevin, of the possibility, by exposure to light, of forming an image in gelatine when impregnated with bichromate of potassium. The steel plate on which the etching was to be engraved was covered with a dry layer of this chromated gelatine, and after exposure in the camera the plate was placed in cold water to remove part of the gelatine and as much of the bichromate as possible. It was then covered with the etching fluid, which penetrated in a greater or less degree through the gelatine film, and the "biting in" thus effected enabled the plate when inked up and printed in the usual manner to give an impression on paper of the object photographed. This method was most successful in the reproduction of line engravings, and when half tones had to be produced he adopted other artifices to which we need not here refer.

It has been stated that Fox Talbot did not protect his processes, but the above list of patents at once contradicts the assertion. Not only did he—as we think quite justifiably—do so, but he strictly claimed his rights, even going so far as to bring an unsuccessful action for infringement, claiming to include in his Calotype patent—which was essentially a paper process—the collodion process of Le Gray and Archer. Mr. P. Le Neve Foster

writes to us that Fox Talbot was so tenacious of his rights that the formation of the Photographic Society was for a time prevented. "I had," Mr. Foster writes, "more than one conversation with him at that time on the subject, and he only yielded, and in favour of amateurs, after much solicitation on the part of the late Lord Rosse and Sir Charles Eastlake, who thereupon became the first president of the Photographic Society."

The accompanying extract from the correspondence, which appeared in the *Times* of August 13th, 1852, between the inventor of the Calotype process and the presidents of the Royal Society and Royal Academy, shows the spirit in which the two latter approached the subject of the patent rights, and the generous tone in which the former responded:—

"The art of photography on paper," Lord Rosse and Sir Charles Eastlake write, "of which you are the inventor, has arrived at such a degree of perfection that it must soon become of national importance; and we are anxious that, as the art itself originated in England, it should also receive its further perfection and development in this country. At present, however, although England continues to take the lead in some branches of the art, yet in others the French are unquestionably making more rapid progress than we are. It is very desirable that we should not be left behind by the nations of the Continent in the improvement and development of a purely British invention; and, as you are the possessor of a patent right in this invention, which will continue for some years, and which may, perhaps, be renewed, we beg to call your attention to the subject, and to inquire whether it may not be possible for you, by making some alteration in the exercise of your patent rights, to obviate most of the difficulties which now appear to hinder the progress of art in England. Many of the finest applications of the invention will probably require the co-operation of men of science and skilful artists. But it is evident that the more freely they can use the resources of the art, the more probable it is their efforts will be attended with eminent success. As we feel no doubt that some such judicious alteration would give great satisfaction, and be the means of rapidly improving this beautiful art, we beg to make this friendly communication to you in the full confidence that you will receive it in the same spirit—the improvement of art and science being our common object."

This letter is dated "London, July," and Fox Talbot replied as follows, under date "Lacock Abbey, July 30":—

"... I am as desirous as any one of the lovers of science and art, whose wishes you have kindly undertaken to represent, that our country should continue to take the lead in this newly-discovered branch of the fine arts; and, after much consideration, I think that the best thing I can do, and the most likely to stimulate to further improvements in photography, will be to invite the emulation and competition of our artists and amateurs by relaxing the patent right which I possess in this invention. I therefore beg to reply to your kind letter by offering the patent (with the exception of a single point hereafter mentioned) as a free present to the public, together with my other patents, for improvements in the same art. ... The exception to which I refer, and which I am desirous of keeping in the hands of my own licensees, is the application of the invention to photograph taking for sale to the public. This is a branch of the art which must necessarily be in comparatively few hands. ... With this exception, then, I present my invention to the country, and trust that it may realise our hopes of its future utility."

In the *Phil. Mag.* iii. 1833 will be found a very curious paper, which might interest Sir William Thomson (who, however, has probably read it), "On the Velocity of Electricity; a Proposed Method of Ascertaining the Greatest Depth of the Ocean." Crystallography and optics came in for a considerable share of Talbot's attention. In 1836, in the *Comptes Rendus*, we find him describing researches on borax crystals, and besides various papers on the subject mentioned, produced in 1836, he gave the Barkerian lecture of that year, the subject being "Facts Relating to the Optical Phenomena of Crystals." In 1842 he read a paper at the British Association "On the Improvement of the Telescope," and another in 1847 "On a New Principle of Crystallisation." He describes in the *Astronomical Society's Memoirs* (xxi.) a total eclipse of the sun, July 28th, 1851, observed at Marienburg, Prussia, and in the British Association Report for 1871 will be found a paper by him "On a New Method of Estimating the Distances of Some of the Fixed Stars."

The subject of heat also had its attractions for his many-sided mind, and in 1836 he contributed to the *Phil. Mag.* papers on the "Repulsive Power of Heat" and on "Radiant Heat." Even botany received a share of his attention, for we find in the *Trans-*

actions of the Edinburgh Botanical Society for 1868 a "Note on *Vellosia elegans* from the Cape of Good Hope."

But the half is not told, and it would take up more space than we can spare, even were it quite appropriate in these pages, to refer to his numerous contributions in literature and archaeology to the Royal Society of Literature (of which he was vice-president), the Society of Biblical Archaeology, and by other methods. Orientalists will call to mind that Talbot was one of the first who, with Sir Henry Rawlinson and Dr. Hincks, deciphered the cuneiform inscriptions brought from Nineveh. He was the author of several books of much interest and learning, and in his "Pencil of Nature," a fine quarto published in 1844, and probably the first work illustrated by photographs, he describes the origin and progress of the conception which culminated in his invention.

HEAT, LIGHT, AND ACTINISM.

BY JOHN DRAPER.*

We may apparently have heat without light, and light without heat. In the darkest room we cannot perceive vessels filled with boiling water, yet the warmth we experience on approaching them assures us that they are emitting radiations. Is not this heat without light? If we stand in the rays of the full moon, we cannot detect any increase of temperature. Is this not light without heat? It is true that in this latter instance we are mistaken as to the fact; but overlooking that—for the heat to be detected in the moonbeams requires the most sensitive apparatus—do not such observations assure us that heat and light are independent of each other, physical principles having an existence separate from each other?

Such were some of the arguments on which were sustained the hypothesis of the intrinsic difference of light and heat. In this no account was taken of the optical functions of the eye. Qualities were incorrectly attributed to radiations which, in truth, were due to peculiarities in the organ of vision.

The great service which the diffraction spectrum has rendered to science is the abolishment of all these imaginary independent existences—heat, light, actinism, &c.—and the substitution for them of the simpler conception of vibratory motions in the ether. The only difference existing among the radiations that issue from a grating, in the manner we have been describing, is in their wave lengths, or, what comes to the same thing, in their times of vibration. The diversity of effects produced depends on the quality of the surface on which they fall. If on a dark surface, and the more so in proportion to its blackness, they engender heat; if on the retina, they are interpreted by the mind as light; if on photographic preparations, they produce decomposition, designated actinic effects.

Heat, light, actinism, are, then, not natural principles existing independently of each other, but effects arising in bodies from the reception of motions in the ether, motions which differ from each other in their rapidity. Of those that the eye can take cognisance of, the most rapid impart to the mind the sensation of violet light; the slowest, the sensation of red; and intermediate ones, the intermediate optical tints. Colours, like light itself, are nothing existing exteriorly. They are merely mental interpretations of modes of motion in the ether, and in this they represent musical sounds, which exist only as interpretations by the mind of waves in the air.

REPRODUCTION OF ENGRAVINGS.

BY COUNT LUDOVICO DE COUNTEN.†

AMATEURS who are not fortunate enough to possess a glazed studio, and often have not even an uncovered terrace at their disposal, are compelled to make their reproductions of engravings, drawings, &c., or of any other flat design, in the vicinity of a window. The difficulty of operating is very great when one attempts to work in museums and picture galleries, and any hint, therefore,

* *Harper's Magazine.*

† *Moniteur de la Photographie.*

which will facilitate one's labours is not to be despised. One of the principal defects when the object is opposite a lateral opening consists in the inequality of the lighting, the side nearest the daylight being much more brilliantly illuminated than the opposite side; and as it is necessary, in order to get at the proper distance, to place one's self on one side, at a very wide angle, it follows that a lengthened pose is necessary. Direct sunlight permits of the reduction of these defects to a minimum. Unfortunately, one cannot always place the camera to the best advantage on the proper side, and the sun, as it rises, soon deprives one of the advantages one hoped to gain.

There is, however, a method of getting out of the difficulty, which consists in the employment of ordinary mirrors of quick-silvered glass. They reflect most of the incident light which is necessary to the purpose. A surface measuring forty by fifty-five centimetres will answer wonderfully well. This mirror is held in the hand, and during the exposure the rays of light are directed upon the object to be reproduced, care being taken to oscillate the surface a little, so as thoroughly to equalize the illumination. The exposure is very rapid under these circumstances.

By employing two mirrors instead of one the rapidity is doubled, and any inequalities in illumination are destroyed in the most effectual manner. Even in the case of a pose in direct sunlight, the shadows may be advantageously combated which are formed by a rugged or uneven surface. The great simplicity of the method, and its incontestable utility, are enough to recommend it.

It is by employing large mirrors in this way, reflecting upon any given surface, that details and minutiae badly lighted up are reproduced on the frescoes at Florence. Therefore, in the reproduction of engravings, the same plan would be advantageous.

NOTES ON COLLODION.

THE United States and British Pharmacopœias give formulae for the preparation of pyroxylin which are in many respects unsatisfactory, especially that of the United States Pharmacopœia. The formula which I have found to answer best in practice is a modification of Professor Maynard's, as follows:—

Sulphuric acid.	2 fl. ounces
Nitric acid	1 fl. ounce
Cotton	½ troy ounce
Stronger ether	14 fl. ounces
Stronger alcohol	4 "

Mix the acids in a suitable covered vessel, and when the temperature of the mixture has fallen below 100° Fahrenheit add the cotton, and imbue it thoroughly and quickly with the acids, and allow it to stand, well covered, for twelve hours. Then press out and pour off all that is possible of the acids, wash with cold water until the washings cease to give a precipitate with barium chloride, throw into a small quantity of alcohol, press thoroughly with the hand, and dry in the air. Lastly, dissolve the cotton in a mixture of alcohol and ether.

In the above process a few points are to be observed. The acids used should be the strongest (commercial) obtainable. The cotton may be either raw or fine, although a collodion made of the former must be allowed to settle one or two weeks, after which the clear portion may be decanted. The vessel used for the process should be either glass or porcelain, and an air-tight covering may be made by slightly greasing the edge, taking care that no grease be allowed to fall into the mixture. The temperature must not be below 100° Fahrenheit before adding the cotton, otherwise the nitric acid will be decomposed, nitrogen dioxide being formed, becoming red hyponitric acid vapours upon contact with the air, which of course spoils the product. With these precautions kept in mind, the process is always successful, which is more than can be said of the official formula.

The Photographic News.

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VIOLET LIGHT AND SUPPLEMENTARY LIGHT.

OUR readers are familiar with the claims recently put forward by Signor Scotellari, an Italian photographer, to the effect that a certain tint of violet light was more efficient in photography than white light, and that studios glazed with glass of the proper tint gave more rapid results than those glazed with colourless glass. In noticing his claims, we pointed out that the coloured light in question was one of the components of white light, and that, unless a part could be greater than the whole, there could be no advantage gained in using it. S. Scotellari was at all times so definite and earnest in his affirmation of the practical advantages gained, and was supported by the testimony of practical men of position and reputation, that we could only with propriety admit that practice in photography had so often been in advance of theory there might be something in it. When we learnt the other day that a firm so shrewd and practical, as well as enterprising, as Marion and Co. had accepted an agency from S. Scotellari to introduce his method, we called with pleasure to meet that gentleman, and hear and see more of the matter. The form in which he now presents violet light as an accelerator may be accepted without scruple or hesitation by anyone. It is not as a substitute for white light in illuminating the sitter, but as a supplementary auxiliary in the fashion which diffused white light has been recommended and used with success. S. Scotellari now uses a lens cap in the end of which is a disc of violet paper admitting a certain amount of violet light. This is placed on the lens after exposure on the sitter, and white light is suffered to pass through it for a few seconds and fall on the plate, which is then developed as usual. The ordinary exposure is said to be reduced about one half by means of this treatment. On the relative advantages of purple light and white diffused light for supplementary exposure we can affirm nothing. We know that capable and trustworthy men who have devoted considerable time and attention to comparative experiments in this direction have declared in favour of coloured light. The late Mons. Constant, who devoted his attention to the matter, believed in the specific advantage of rosy light, as accelerating most with least risk of veiling or fog. That supplementary light may be made available as an accelerator with little or no risk we are satisfied, both from personal experience and from observation; and that it has hitherto received so little attention and practical application is to us a constant matter of surprise. If S. Scotellari's use of violet light be found an improved mode of using supplementary light, and, at the introduction of it to photographers by Messrs. Marion and Co., induce many to examine the matter who have not hitherto given it attention, we think a special advantage to photographers will be secured.

THE PHOTOGRAPHIC EXHIBITION.

PORTRAITS AND FIGURE STUDIES.

THE present exhibition has some excellent examples of portraiture and portrait studies, in all of which the technical qualities are fine, and in many there are manifestations of improved pictorial aim. The foreign contributions in this direction are numerous and excellent. Messrs. Stillfried and Anderson send many examples from Japan, in which class or caste distinctions are finely and subtly worked out. In one frame we have an "old man" and "old gentleman," in which the distinction is marked more strongly in the air of culture and refinement in the face of the latter than in the costume, in which latter points the difference is not necessarily manifest to Western eyes. A "Young Girl" of Yokohama presents a soft, comely face, sufficiently attractive, without possessing the charms of Western beauty. "Young Ladies" (22) are interesting examples of Japanese beauty. M. Bernard Michewski, of Dantzig, sends many fine portraits, well lighted and delicate and brilliant. Remarkable for fine lighting, fine definition, and admirable modelling, are two very large portraits, one described as "taken direct in the camera, with Dallmeyer's 6A lens, in sixty seconds," and the other, similar in qualities, described as "taken direct with Dallmeyer's 6A lens in fifty seconds." The exposure is marvellously short for such large portraits; but whether especial chemical conditions or mode of lighting, as well as a fast lens, were employed, is not stated. Some exceedingly spirited and artistic portrait studies are sent by a Spanish amateur—S. Carlos Relvas. Jean Baptiste Feilner sends a number of very effective and vigorous portrait studies, of which one frame, "Characteristic Heads of an Actor" (363), is very instructive. There are about a score of portraits all of the same head, which, in *propria persona*, is seen in the centre. Almost every possible varied phase of character and expression is represented by the same head, the difference being due to expression and "get up." Age and youth, dignity and weakness, strength and folly, are depicted and admirably portrayed. These are, of course, intentional personifications; but they suggest to the photographer how much of truth and characteristic quality in a portrait are due to entourage and the expression of the moment. Messrs. Taeschler Freres, of St. Fiden, send some exceedingly perfect portrait studies, an especial feature of which is the varied and interesting pictorial backgrounds; in many respects these are amongst the gems of portraiture in the exhibition. They also send a negative to illustrate their mode of working in the background at the back of the plate, a method which, in their hands, is manifestly very effective. Mr. Gutekunst, of Philadelphia, sends fine examples of portraiture, notably a large and impressive portrait of Longfellow, the American poet. Mons. Klary, of Algiers, whose system of lighting has been much talked of, very wisely sends examples of his work, which is very fine, and illustrates the value of the method of lighting by the aid of portable screens, which, if not originated by him, he has at least made his own by thoroughly working it out, understanding, applying, and describing it. His contributions will well repay study. Messrs. Schulz and Such, of Carlsruhe, send some very fine portraiture. A portrait finished in the Vanderweyde style (149) is singularly brilliant, delicate, and finely modelled.

Mr. Valentine Blanchard sends, as usual, some noble examples of portraiture. His "Yokohama Belle," a comely Japanese head, is a very fine and effective portrait study. The study of an old man (275) is an unusually fine example of untouched work, the strongly-marked face and grey hairs well suggesting King Lear, a quotation from the play accompanying the picture. A portrait of Mr. Hugh Owen, well known as an enthusiastic photographer in the early days of the art, is a fine characteristic piece of portraiture. A study entitled "Keolanthé" (384) is very

fine, and thoroughly Greek in style and feeling. Mr. Owen Angel, of Exeter, sends some of the finest collodion transfers we have seen, consisting of both portraits and studies. They are distinguished by fine artistic feeling, and, with all the delicacy of the collodion image, there is singular richness and force very rarely indeed attained in this class of printing. A large number of very fine examples of portraiture are sent from the studio of the late A. Boucher, of Brighton. A portrait of a lady, "Miss Bayliss, as Claudia, a British Christian Lady of the First Century," is singularly charming; a peculiar sweetness and purity characterize the face, and a rare delicacy and grace are manifest in the figure, and the general treatment is admirable. The establishment in question is manifestly fortunate in its management since Mons. Boucher's death.

Mr. G. Nesbitt, of Bournemouth, maintains the high position he secured last year in portraiture and figure studies. There is throughout his work a fine pictorial feeling and perfection of modelling and solidity, with great delicacy, rarely attained. "Tired Companions" (241), a noble dog and fine child reclining together, is singularly fine. A clever study, entitled "Monti" (166), skillfully meets a difficult task, the face being covered with a veil. The effect is very good, the veil being sufficiently transparent, and both light and shade and definition in the face underneath are well secured. The picture reminds us of those sculptured heads which took the world by surprise in the Great Exhibition of 1851, when Raffaele Monti exhibited some wonderful veiled heads in sculptured marble. Lombardi and Co. exhibit some fine examples of portraiture, with a slight suggestion of over-touching, however. Mrs. H. E. Roscoe sends a number of excellent portrait studies, fresh and artistic in feeling, and possessing much technical excellence.

Mr. Faulkner's instantaneous studies of children, chiefly babies, are always charming and always fresh. He seems to possess the mystic power of himself becoming a child with children, he secures such freedom from constraint, such natural smiles and unconscious graces. His selection of enlargements by the powder carbon process from some of his infantile clients is exceedingly fine. His finished enlargements of the same kind, "Master Tidcombe" (185), "Lord Leveson Gower" (253), and portraits 207 and 362, are beyond praise. A pretty portrait of a child, manifestly an enlargement from a small instantaneous picture, is exhibited by Mr. H. Baden Pritchard; it is entitled "Waiting to go on;" the infantine model is dressed in the pantomime costume of a clown, and seems from his expression to enjoy the humour of the position. Mr. B. Wyles sends some effective photographs; "A Roman" (215) is a good photograph of a sturdy but somewhat clumsy-looking model. Mr. John Hawke sends some very fine portraits and portrait studies. A very charming little study entitled "Lizzie" (459) is exhibited by Mr. E. J. Ayres. A series of groups in room interiors, printed in carbon, is exhibited by Mr. James Paton, which are very effective and naturally lighted. The portraits in crayon style of finish by Mr. G. Piercy, Jun., are exceedingly satisfactory. Of the few card pictures exhibited, those by Messrs. Done and Dudman are worthy of notice. Wolstenholme Brothers send some good examples of portraiture in carbon. Mr. A. Debenham, Messrs. Barry and Co., and some others, also send good portraiture.

We shall return to the subject of studies and portrait enlargements in a future notice.

SERIAL PHOTOGRAPHY.

We have lately heard of several schemes for the accomplishment of serial photography, and although we are not at the present moment at liberty to mention the names of

the gentlemen engaged in the elaboration of these instruments, nor their precise nature, we have reason to believe that already one apparatus of the kind has been perfected, and is ready for trial. The object of the instrument in question is to do away with the monotonous, and produce pictures in a camera floating in the air, which are developed on falling to the ground. The raising of the camera into the air, the opening and shutting of the dark slide, and safe conveyance of the apparatus to the ground again are the problems to be solved, and these, we hear, have been satisfactorily combated by two skilful experimenters already.

The apparatus is more especially for use in warfare, for reconnoitering purposes. Balloons that would carry up an operator and his apparatus would doubtless be the most satisfactory way of securing aerial photographs; but since the acquisition of these monsters in the field is a source of great difficulty, the new apparatus is intended as a substitute. That anything of the kind in the least degree successful would be warmly welcomed by an army in the field there is no room to doubt, for during the last fifty years military engineers have been engaged with the matter of ballooning. In Bulgaria, just now, such an apparatus would be invaluable to the Russians, who seem to lose sight and touch of their enemy for days and weeks together sometimes. The *Daily News* special correspondent remarked but the other day upon the ridiculous circumstance that "a force of twenty thousand of the enemy can disappear and be entirely lost for some days, when they have in reality only retired a few miles, and have posted themselves in new positions like the old ones. This is, nevertheless, an event of very common occurrence with the Kustchuk armies. The conformation of the ground is well adapted to the easy concealment of small camps, and even of the movement of troops, for the country is undulating, and everywhere there are large tracts of a small growth of oak trees crossed by frequent paths and practicable for cavalry and light artillery. So that by reason of being unable to take an observation a few feet from the ground, the Russians have remained in total ignorance of the whereabouts of their enemy. In fact, they do not seem to know as yet whether the army lately commanded by Mehemet Ali consists of twenty thousand men or one hundred thousand. Yet the fixed ascent of a balloon would have told them this long ago, while a photograph secured in an instant would have mapped out the enemy's positions in a trice. To show what a slight elevation is required to afford the necessary information, the same special correspondent says,—"Two miles beyond the village we came out on an open field, and there lay before us a panorama of the whole Turkish encampment miles away, extending along the further side of the valley."

If any of our clever experimenters can, therefore, manage to devise a practical aerial camera, they may rest assured there will be no lack of patronage just now.

PHOTOGRAPHY IN GERMANY.

SOME IMPROVEMENTS IN CARBON PRINTING.

Berlin, October 21st, 1877.

As I am frequently busy making carbon prints, and experience has shown me how to get over a good deal of difficulty, I think it proper to communicate to the readers of the *News* the different improvements by means of which I succeeded in avoiding many a mistake that rendered it impossible to obtain good results.

The composition of the sensitizing bath, for instance, has been the subject of serious study on my part. The selection of the salt used for it is by no means indifferent, imperfections being always the result of a carelessly prepared solution.

As to the bichromate of ammonia, so often recommended as being superior to that of potassium, I could not find any advantage in using it; the only superiority I remarked was with respect to the price. A remarkable thing with it is that the single chromated salt is as sensitive as the bichromate.

I prefer making use of the bichromate of potassium, however, to prevent the paper becoming insoluble, and of no use, therefore I now always prepare the following solution:—

Monochromate of potassium (yellow)	5 grammes
Bichromate of potassium (red) ...	5 „
Water	150 cub. cents.
Alcohol	40 grammes

In winter you need not take so much alcohol as in summer. The formula above mentioned is used for sensitizing in winter. Do not add the alcohol before the salts are entirely dissolved.

As for drying the tissue, I have never been satisfied with the commonly-used methods. I always found it somewhat uneven when dry, and never sticking close to the cliché. Now I proceed as follows, and have always a beautiful, smooth tissue:—

I take a glass pan, clean it carefully, and then rub it, by means of some filter-paper, with a little turpentine oil in such a manner that a very thin film of grease remains on the glass. Afterwards I rub the same side over with some talc, but only so much that the surface of the glass has a somewhat blue appearance. The talc may be applied by means of a little pad of wool. Now, the tissue being sufficiently sensitized in the bath, I take it out (allowing the liquid to drop off), and then lay it carefully, avoiding the formation of air-bubbles, on the prepared side of the glass, cover it with some gum or caoutchouc cloth, and pass the squeegee energetically over it. It is of the highest importance to have no air-bubbles between the glass and the tissue; however, working carefully, you will soon succeed well. The tissue is allowed to dry on the very same glass plate, which will take six to eight hours. When dry, you need only to lift one edge of the carbon paper with your knife, and it will easily leave its support, showing a beautiful mirror-like shine, and being completely smooth and even. I find this method of drying so excellent that I never do otherwise, and my tissue always lies closer to the paper than before.

You will please take notice that this manner of preparing the glass is, for the double transport from glass, in my opinion superior to rubbing with wax. As I have been annoyed by blisters appearing on the gelatine film, and by the copies leaving their support when dry, I altered my method of transferring, and am now not suffering from these evils.

The copy is dipped a minute or two into clean water, then laid on a glass plate, the gelatine film below, and carefully squeezed, so as to expel all remaining water. Now I lay it for a short time only into an alcoholic solution of white shellac (about two to four per cent.), where it remains until the back of the tissue gets a grey appearance. Meanwhile I dip the transport tissue into another dish with water, lay it afterwards on a glass plate, take the copy out of the alcoholic solution of shellac, and put it, when sufficiently dripped off, on the transport-tissue, treating both with the squeegee as usual. By this shellac bath the picture will always closely stick to its supports, never show blisters, and lose its dull appearance. If you take care to cover the dish containing the shellac solution with a glass plate every time there are some copies therein, you will have no considerable loss by the evaporation of the alcohol; and following the indicated methods you will feel perfect satisfaction with their results.—Truly yours,

ERNST DUEBY,

Editor of the Photographisches Wochenblatt.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

[In the last number of THE NEWS, the left-hand figure on page 500 should have been inserted beneath the figure on page 501, as an illustration of the form of the T-piece recommended.]

Having constructed this automatic motion for the prisms, and adjusted the collimator, the latter is placed in position indicated in the first column of page 500; but a further precaution is advisable, viz., to see that the slit is vertical, and that the axis of the collimator is in an absolutely horizontal line. The levelling screws inserted at the bottom of the cradle supply the means of this last adjustment when a small level is placed along the tube. After the prisms are placed in position on the slab, the slot in the shaded card referred to in the last number is placed at right-angles to the axis of the collimator; or this may be effected first, and the prisms placed in position afterward. In fact, this last procedure is the better of the two for a beginner, since at first he will often fail to secure the passage of the light through more than two prisms. We will suppose, therefore, that the slot is placed at right-angles to the axis of the collimator, and that the prisms have to be adjusted afterwards. The triangular portions of P (or their substitutes, the T-pieces) are placed with their bases at about the angle shown in the diagram, and the prisms laid upon them, the base of the card pattern and of the prism being coincident. The slit of the collimator is now widely opened, and a beam of light caused to fall upon it. If the heliostat (or source of light) is in the right position, an image of the slit should shine centrally upon the collimating lens, and the former must be adjusted till this is the case.

It is recommended to place a loose-fitting disc of opaque paper, in which an aperture of the proper size is cut, round the collimator, in order to cut off any extraneous beams of light.

To facilitate matters, the condenser may be used to focus the beam of light upon the slit, and, by its employment, nearly the whole of the collimating lens will be filled with a circular patch of light. Next take a small white card, and hold it between the first prism and the collimating lens, and note if the rays from the disc of light fall entirely on the surface of the prism. If not, move the whole slab backwards or forwards till the central rays of the disc fall on the centre of the prism. Next insert the card between the first two prisms, and notice if the rays of light still fall properly on the surface of the second prism. If not, the angular positions of the prisms must be altered by moving the arm K till it falls approximately correct. All the other prisms will now be in adjustment if the automatic movement be correctly made; and, by holding a card behind the last prism, a brilliant though impure spectrum should be visible. Now, by placing the axis of a small telescope (one half of an opera glasses) in the line indicated by the dotted line in the diagram, the ray of light for which the prisms are adapted will be seen in the centre of the field. If this be not the ray required, the prisms must be moved by the automatic arrangement till the desired end is obtained. Before fixing up the camera it is as well to see that the faces of the prisms lie accurately in vertical planes. With the glass prisms as supplied by manufacturers the top and base are invariably cut at right angles to the faces; hence, by placing a small spirit level on their tops, prisms of this description can be readily adjusted, a sheet of thin writing paper placed beneath some one corner being frequently enough to secure the necessary vertical position.

When hollow prisms filled with carbon disulphide or other such refracting liquid are employed, the accuracy obtained by a plumb line is sufficiently good. For solar work in which the absorption lines are required, glass prisms are much to be preferred, since with them there is

no fear of obtaining diffraction lines, and instead of six pieces requiring to be worked in each prism, only two are required, for it must be recollected that to obtain as good results in both cases, each surface of the two glass plates cemented to the cut bottle, and the sections of the bottle, require "working" into parallelism. Another point also not to be lost sight of in these prisms is that the pressure of the liquid is liable to cause a curvature in the sides.

The camera is next placed in the position lately occupied by the telescope, the lens being of such a size as to take in the whole of the beam of light refracted by the last prism.

A dark cloth is then thrown over the whole of the prisms, camera, and collimator lenses, and when the slit is closed or covered the camera should appear perfectly dark. The focussing may now be undertaken, and this is the most trying part of the operation, and requires the exercise of extreme patience, and the expenditure of a certain amount of time.

Close the slit to say the $\frac{1}{8}$ of an inch, and view the spectrum on the focussing screen without the aid of a magnifying glass. When the absorption lines appear tolerably defined, remove the screen, and substitute for it the dark slide, in which a piece of flat glass replaces the sensitive plate. Previous to this, however, the magnifier described in the last number should be adjusted anew. On one side of the piece of flat glass (which should be patent plate) should be drawn a fine ink line as before, but the draw tube should be adjusted so that when placed against the unmarked surface of the glass the ink line should appear in sharp focus. When the plate is placed in the dark slide in the camera, and the images of the lines fall accurately on the surface of the plate, they will appear in focus with the magnifier. The front and back of the slide must of course be opened, and the image viewed in the manner indicated, the focus of the camera being altered till absolute sharpness is obtained. It may be asked, "Why not focus with the ordinary focussing screen?" The answer is, that it is impossible to see the fine lines on it owing to the coarseness of the grain. Dr. Monckhoven proposed to use a moving focussing screen to avoid this, but in my hands it is perfectly impracticable. In this final focussing operation the slit should be nearly closed, $\cdot 00\frac{1}{2}$ inch with the length of collimator given in the last number being the largest opening which will give results of any value.

It may, perhaps, not be out of place here to say a few words on the effect that the length of collimator has on the resulting picture. The rays of light coming from the slit are made parallel by the collimating lens, and therefore the breadth of the image of the slit, which is measured by the breadth of the finest absorption lines, is dependent on the ratio of the focal lengths of the collimating lens and camera lens. Thus, if the breadth of the slit is $\cdot 00\frac{1}{2}$ inches, and the focal lengths of the collimating and camera lens are eighteen inches and six feet respectively, the breadth of the finest absorption line that will be sharply defined will be $\cdot 00\frac{1}{2} \times \frac{1}{3} = \cdot 016$ inch. It will thus be seen that the longer the collimator the finer the lines will be that it is possible to obtain. To counterbalance this advantage, however, remains the fact that the increase in the length of the collimator diminishes, in exactly the same proportion, the image of the length of the slit, and the consequent breadth of the spectrum. Thus, in the above example, a slit a quarter-inch in length will give a spectrum one inch in height, and if wanted the same height with a six foot collimator we should have to increase the length of the slit to one inch. As can be well understood, it is much easier to make the former length of slit work "true" than the latter. Whether a long or short collimator be employed, however, the same amount of dispersion is secured, it being entirely dependent on the number and quality of prisms employed. For some purposes a collimator of three feet is useful, but for ordinary work it is too cumbersome.

The final focus should be given to the image by allow-

ing only the light from the heliostat or source of light to fall on the slit. If the collimator has been properly adjusted the movement of the camera towards the prisms, or away from them (keeping the axis of the lens in the same line), should cause no alteration in the focus of the image of that part for which it was adjusted. This is, perhaps, the best test that can be applied as to its adjustment. For focussing the invisible rays, trial must be made by exposing plates. This ought not to be necessary till the H lines are nearly reached. When a horizontal swing back is attached to the camera, sharper focus may be given to parts away from the centre of the field, which should be the part focussed, by swinging it in towards the violet end, and, consequently, away from the red end of the spectrum. If the swing back be swung before focussing, it is probable that the magnifier will have to be discarded, since its axis would make an angle with the rays striking the focussing plate. In my own camera I have an opening cut at the top in front of the plate; and, for the glass plate, I substitute a smooth, white surface, and view the spectrum through the opening by a telescopic arrangement. By this plan the swing back can be altered at pleasure.

WRINKLES FROM THE ANTIPODES.

BY J. C. STEPHENS.

At the risk of being charged with heresy (photographic), my advice is, do not filter your negative bath solution. This change from old recognised working has been forced upon me from the belief that filtering-paper of the present day has, like a great deal of other photographic material, very much deteriorated in quality from what we used thirty and thirty-five years since. If the bottle of solution is left to stand, especially in the sun, it will be found to get clear and bright, anything held in suspension gravitating to the bottom. When clear, draw it off by means of a syphon; the short leg should be sufficiently clear of the sediment as not to allow it to flow up. The syphon may be started into action by means of a short, straight piece of glass tube going through the cork, and blowing somewhat strongly through it, which, increasing the pressure of the atmosphere on the solution, causes it to rise and flow round the neck of the syphon. Care should be taken to stop its action when the top has fallen down to three-eighths or half an inch of the end of the syphon in the bottle, so as to prevent any scum which may be on the surface from flowing over. Any one who tries this plan will, I think, soon find he could get cleaner negatives, and not so subject to oyster shells, or matt silver.

The hypo used for fixing prints should, when dissolved, be neutralized with carbonate of lime (chalk) in powder in preference to either potash, soda, or ammonia, and very carefully filtered. Small spots of non-fixation are very often caused by little particles of undissolved substances, which, being held in suspension, fix themselves upon the surface of the prints when placed in the solution, and so wherever that is the case prevents the action of the hypo upon the silver.

METHYLATED SPIRIT.

METHYLIC ALCOHOL, wood spirit or wood naphtha, is one of the volatile products obtained by the destructive distillation of wood, sawdust, spent dyewoods, &c. It is used in a variety of chemical operations, and in the manufacture and preparation for use of certain artificial coloring matters. It having, fortunately, a very disagreeable taste, it is never used for drinking, and hence it may be manufactured, sold, and employed in the arts without any Excise interference.

Methylated spirit, however, is a very different article. It consists of ordinary (so-called ethylic) alcohol mixed with about five to ten per cent. of the true methylic alcohol just mentioned, and is, therefore, not a definite chemical compound, but a mere mixture. The origin and history of this

"methylated spirit" may be briefly stated as follows. Methyl alcohol (wood spirit), though very useful to the chemical manufacturer and color maker, cannot be used as a substitute for common alcohol (spirit of wine), but produces different results. It was also found that many chemical operations which require spirit of wine could not be carried on as cheaply in England as on the Continent, where spirit is much cheaper on account of the smaller duty payable on its manufacture. Government was therefore petitioned to grant some relief to manufacturers by remitting the duty payable upon alcohol used in the arts. The result was the concoction of the mixture known as "methylated spirit," which was supposed to be undrinkable, and which, under certain conditions, was to be sold duty free to dyers, &c. Unfortunately the mere addition of wood spirit to alcohol did not seem to the authorities a sufficient precaution. Except a manufacturer or dyer was able to give security in £1,000 not to use or allow to be used the "methylated spirit" for drinking purposes, further additions were insisted upon. One of these consists in dissolving in the spirit a small quantity of shellac. This addition was proposed in the interest of the varnish makers, who, it was erroneously supposed, would be the main consumers of methylated spirit, and to whom the presence of shellac would be no detriment. In this state the spirit is sold under the name of "finish." This addition, for the color maker and dyer, is one of the most unfortunate that could have been devised. It makes all colors come up flatter, and gives reds especially a dull bluish tone. To detect shellac in methylated spirit it is merely necessary to add a spoonful of the suspected sample to a large glass of pure water, say condensed steam water, and stir up well. If shellac is present it will be precipitated, and occasion a white turbidity or milkiness in the liquid. Sometimes instead of shellac a small quantity of some aniline color, blue or red, is added to the spirit. Whatever color is selected will, of course, in certain cases prove objectionable.

We should suggest that if any further addition to the methylated spirit is really needful—which we doubt—something of an intensely nauseous flavor would be much better than colors or resinous substances.

On the Continent ordinary alcohol is cheaper than wood spirit, and hence purchasers of the latter sometimes find it more or less adulterated with the former. To detect this fraud Riche and Baidy heat the suspected sample with sulphuric acid, dilute with water, and distil. They then mix the distillate with peroxide of manganese and sulphuric acid, thus converting the ethylic alcohol into aldehyde, and add a solution of hyposulphite of soda, and finally some magenta. If common alcohol is present, even to the extent of one-tenth per cent., the magenta takes a violet color.—*Chemical Review*.

ARTIFICIAL BEESWAX.

A MIXTURE of paraffin and common resin has found its way into the market as a substitute for beeswax—indeed, it has been sold for that article—but in this case the cakes were covered with a thin coat of genuine beeswax. According to a recent chemical examination of the artificial beeswax, the appearance is well calculated to deceive, as the compound is almost identical in looks with the genuine wax, whilst in colour, brittleness, fracture, and adhesiveness, the difference is very slight. The outer surface of the sham article possesses the characteristic honey-like smell of genuine wax; but freshly-broken surfaces have a marked pitchy odour, and do not exhibit the same lustre as the genuine wax. Melted at a gentle heat the smell of honey is lost, and the pitchy odour asserts itself in an unmistakable manner; at a stronger heat it becomes intense, and persists for a long time. The melting point of the false wax is about 160° Fahr., and its specific gravity about 0.962. In its further qualitative examination 1 gramme was warmed with 10 grammes of chloroform in a small flask. The solution was clear and yellow, but soon became

turbid on cooling, and an almost transparent, colourless, serous mass separated, more particularly upon the walls of the flask. Afterwards 1 gramme was dissolved in 15 grammes of 70 per cent. alcohol by boiling, and allowed to cool. In the clear, yellow-coloured solution, round and half-round colourless granules were deposited. These were recovered by filtration, dried in the air, and weighed: 6 decigrammes were thus obtained. The specific gravity of these granules was 0.910. The filtrate was evaporated at a gentle heat, and left as residue a brittle resin of a beautiful dark-yellow colour, weighing about 4 decigrammes. Further, 1 gramme of the wax in raspings was boiled, and well shaken in a solution of 1.4 gramme borax in 20 grammes of distilled water. A colourless mass separated on the surface of the liquid in the vessel. The liquid was turbid, but on cooling was neither milky nor gelatinous; Japan wax was therefore not present. The same experiment was made with the granules free from resin. This time the fluid remained clear during boiling and when cooled. The granules united into a cake at the top of the fluid. A sample in fine shavings was then agitated with diluted ammonia solution: a portion of the residue above-mentioned, free from resin, was also treated with ammonia. In both cases the fluid remained clear and transparent, and the samples unchanged, indicating the absence not only of stearin, but also of circumin and olearine. The granular body, quite free from resin, which, according to the above tests, contained neither stearin nor Japan wax, was now tested for paraffin. It had a lustrous appearance and alabaster-like transparency, yielded between the fingers without adhering, and dissolved easily and completely in oil of turpentine and benzine, but not at all in five parts of absolute alcohol. The quantitative analysis brings out the quantities as 60 per cent. paraffin, and 40 per cent. of yellow resin.—*English Mechanic*.

Correspondence.

THE SIMPLE SPECIFIC GRAVITY APPARATUS FOR LIQUIDS.

DEAR SIR,—In the current number of the *News* (page 495) you give your readers the benefit of a description and sketch of a little apparatus for determining the specific gravity of liquids, for which you acknowledge yourself indebted to the editor of the *Chemical News*. It is published in the name of Mr. James Taylor, of Owen's College, who does not seem to be aware that the apparatus in question is "as old as the hills," or, at any rate, has been known in this country for close upon thirty years. The first account of this identical instrument—Alexander's hydrometer—appeared in Poggendorff's *Annalen*, after which it got noticed in France and England. I well remember that several of these instruments were fitted up by the students whilst I was at the Royal College of Chemistry, in 1849, on the appearance of Hofmann and De la Rue's published account of it in vol. 1 of their "Annual Report of the Progress of Chemistry" for 1847-1848. I myself made one of them, and, if I mistake not, the editor of the *Chemical News*, who was then my fellow-student, another. But it is unnecessary to say more than that the instrument was well known to us all by the following description, which I quote from the Report in question:—

(Page 28). "Determination of the Specific Gravities of Liquids. Hydrometer.—Alexander has proposed the application of a long-known principle for determining the specific gravity of liquids. Two parallel graduated glass tubes, both open at one end, and communicating with each other at their other ends, at which two small syringes are introduced, the one into water, the other into the liquid to be examined. The air in the tubes is now slightly rarefied by means of the syringes, when, by comparing the elevation of the water and of the other liquid in the tubes, the ratio of the specific gravities is given. Alexander calls

his instrument *hydrometer*; he recommends it for practical purposes, but it is scarcely probable that it will be generally adopted."

The indications afforded by Alexander's instrument are subject to errors arising from capillarity (particularly in the case of tubes so narrow as 5 mm. diameter), but this form of hydrometer is certainly far more accurate than has been asserted by Mr. Taylor, who is content with "results correct to the first decimal place," or it could never be employed at all in chemical laboratories.—I am, dear sir, yours truly,

JOHN SPILLER.

London, October 20th.

EXHIBITION BLUNDERS.

DEAR SIR,—Last year there was a great fuss made because some few exhibitors wrote their names, &c., on their exhibits. I only wish that I had taken the same precaution this year, we should then have been saved the "luxury of grumbling," not altogether so much on the fact of there being so many mistakes in the catalogue, as at the short-sightedness of a rule that reads two ways, and which led to the almost unpleasant correspondence of last year.

Of course it would be unkind to blame our very worthy and deservedly respected assistant secretary for all the mistakes; but, at the same time, one cannot help thinking that a hint from him in the proper quarter would have had the desired effect, viz., that it would lighten his labour and cause fewer mistakes, and less heartburnings to individual exhibitors, were they to write or print on the front of their exhibits the title and name, as Colonel Stuart Wortley has done in this year's exhibition.

One doesn't know whether other exhibitors have as many mistakes in catalogue as myself and Mrs. Payne. If so, I pity them, and blame myself; because, should we ever exhibit again, we shall not subject our pictures to be stated as the work of another photographer, as are numbers 455 and 456; neither shall we stand the chance of having another picture hung horizontally when it should have been perpendicular. Nor would the public be puzzled to know what a "Night Blooming Cereous" was (No. 423). Neither would there have been such a stupid mistake as a "Group of Cocks" (No. 371) had one written on mount "Group of White Cochins." Neither would the "Pair of Aylesbury Ducks" (No. 232) have been passed comparatively unnoticed had the catalogue described them as intended and sent with them, viz., "The Heroes of a Hundred Fights;" for that identical pair of ducks had beaten everything shown against them in upwards of a hundred prize poultry shows in the United Kingdom, and consequently their points would be the more studied by connoisseurs attending the Exhibition, and would probably attract others.

I think, sir, I have written enough to show that it is advisable, where practicable, for every exhibitor (especially our friend Mr. Higginson and myself) to write plainly on their exhibits everything they wish the public to know, and not to leave it to the chance medley of assistant secretary's assistants, whether in or out of the printing and publishing departments.—Your obedient servant,

S. GLEN PAYNE.

P.S.—I have just discovered that No. 540 should have been copies of "Tapestry," and not "Paintings."

[The blunders to which our correspondent refers, and similar errors in regard to others, are certainly very lamentable, and should have been avoided. We cannot say where the responsibility rests, but it is very deplorable that any portion of the success of an exhibition which promises as well as the present should be perilled by such sources of annoyance. We have reason to believe that the rule forbidding the appending of names to pictures was entirely rescinded, having been found to work so disastrously last year; but, by some oversight, it crept into the printed conditions

again. Our correspondent will see that in a second edition of the catalogue many of the errors of which he complains have been rectified, and others, whilst very irritating, will not mislead. For instance, any observer interested in the picture will not be misled by the mis-spelling of the *Cereus*, or Torch Thistle, but will be more interested in noting that, being the night-flowering species, it must have been photographed by evening light.—ED.]

CONVERGING PERPENDICULARS IN ARCHITECTURE.

DEAR SIR,—Perfectly fair criticism—however hostile—I can always read with pleasure. In a review of the Society's Exhibition by the Editors of the *British Journal*—No. 25, a street of ancient "Hooded Roofs—Pent Houses at Morlaix, Finisterre," is singled out as "a forcible example of the effect of pointing the camera upwards without making use of the counteracting agency of a swing-back to prevent the convergence of the marginal lines;" and, moreover, "the only one in the Exhibition showing the defect in question!"

This delicious piece of flippant, off-hand criticism would be amusing were it not mischievous.

Permit me to inform these censors that I always use a "swing-back;" that, in this instance, the camera was not "cocked," for the simple reason that there was no occasion for it; and that No. 25 is entirely free from any convergence of the lines.

I enclose a copy for your examination, and also a number of others, forming part of two large series, which I have this morning gone through without finding a single "example of the defect in question." They were all taken with Dallmeyer's extra-wide angle lens for confined situations.

Unfortunately, in consequence of my absence abroad, a few random specimens (the first rough proofs) only were sent for exhibition, and of those, the more important were not hung, from want of space in consequence of the unusual number of pictures sent in.

Before speaking *ex cathedra* of converging lines in architectural subjects, the Editors should endeavour to acquire some rudimentary knowledge of architecture. It is not necessary to spend—as I have done—a great part of my life amidst architectural subjects in every corner of Europe. To illustrate my meaning, let any one passing Whitehall pause at the entrance to the Horse Guards, and examine the façade of Inigo Jones' noble Palladian structure. A photograph of it would certainly be stigmatized by these sapient gentlemen as a frightful example of converging lines. Yet the great architect knew perfectly well what he was about, and perfectly achieved the effect at which he aimed in his designs!—I am, sir, yours obediently,

STEPHEN THOMPSON.

[The examples, similar to those in the Exhibition, with which Mr. Thompson favours us, are very fine, and altogether free from the technical defect in question. It must be admitted that the over-hanging upper storeys and heavy gables which prevailed in the sixteenth century may deceive the eye of a superficial observer, and produce a suggestion of converging perpendiculars, which a more careful examination or an instructed eye will readily determine to be only optical illusion. It is true, a critic is supposed to know something of everything; but he may be pardoned for not being familiar with the domestic architecture of Andrea Palladio, or of the works of his noblest English exponent, Inigo Jones.—ED.]

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, which will be held in the rooms of the Society of Arts, Adelphi, on Thursday, November 1st, a communication will be made by Mr. T. J. Peartall, F.C.S. Subject: "Educational Aid by Photographic Exhibits."

PHOTOGRAPHING A TROTTER HORSE.—The San Francisco *Alto* of the 11th of August says:—"In our mention of the photographs taken by Maybridge of Occident at full speed we stated that it was the intention of Mr. Stanford to have a series of views taken to show the step at all its stages, so as to settle the controversy among horsemen about the question whether a fast trotter ever has all his feet in the air at once. Mr. Maybridge has now received his instructions, and will commence his work so soon as he can receive the needful lenses from London, and can have machinery made here. Occident moves 20ft. at a stride, and Mr. Maybridge will have a dozen photographic cameras placed at intervals of 2ft., making a total distance of 24ft., a little more than a full stride. The shutters of these cameras will be opened and shut by electricity as the horse passes in front of each, the time of exposure being, as before, not more than the thousandth part of a second. The 12 pictures will be taken within two-thirds of a second, the time required for travelling 24ft. at a speed of 2.37. Each picture will be taken by a double lens, so as to be adapted for the stereoscope, and will thus furnish the most conclusive proof to connoisseurs that it is faithfully taken by photography, and not materially changed by retouching." It will be noted that lenses for this special work must be made in England.—*Ed. P. N.*

THE OREGON SILVER MUD.—Professor Silliman, of New Haven, informs us that the alleged argentiferous mud of Wasco county, Oregon, an account of which we recently copied from the *San Francisco Examiner*, is a fraudulent production. As regards the form in which the silver was added, Professor Silliman says that the metal in the sample analyzed by him was spongy, in a grey powder, and generally in the condition in which silver appears when reduced by zinc. An authentic example from the locality, obtained by a trustworthy correspondent of Professor Silliman, yielded no silver whatever.—*Scientific American.*

PREPARATION OF CELLULOSE.—Paper is treated by a continuous process with five parts of sulphuric acid and two of nitric acid, which convert it into a sort of gun-cotton. The excess of acid is removed by pressure, followed up by washing with abundance of water. The paste, when thus washed, drained, and partially dried, is ground in a mill, mixed with camphor, ground again, strongly pressed, dried under a hydraulic press between leaves of blotting paper, cut, bruised, laminated, and compressed again in a special apparatus, suitably heated. It is said to be hard, tough, transparent, elastic, fusible, becoming plastic and malleable at 125°. It ignites with difficulty, is decomposed suddenly at 140° without inflammation, and gives rise to reddish fumes. It is inodorous, and does not become electric on friction.—*Bull. de la Soc. Industrielle de Rouen.*

To Correspondents.

J. B. M.—Much depends upon what you are copying as to the best mode of going about it. As a rule, a bath slightly acid will be more convenient for copying work than one quite neutral. If you are copying an engraving you will often find a weak developer better than a strong one; but for oil paintings the strong one will often answer best. A ripe collodion is generally best.

J. H. B.—Your letter is singularly inexplicit, and gives us no data upon which to give you information. What is your enclosure, and how produced? It appears like a collodion transfer, partly bleached by means of bichloride of mercury. How can we answer your second question, which stands thus: "Is it the rough side of ground glass or the smooth side?" Is it the rough side or smooth? You give us no context to suggest even a clue to your meaning.

J. J. F.—You will no doubt succeed if you persevere, but you must use care as well. The two stereo slides you enclose are examples of very careless work. One of them is mounted wrong; the halves require transposing. The other is clumsily cut and crookedly mounted. The snowy effect of stereoscopic pictures is chiefly due to the use of an over-intensified negative. Sometimes a similar effect is due to a paper rough surface, every little point on the surface of which reflects light; and this effect, being magnified in the stereoscope, gives a snowy effect.

TUXONO MIRIAM.—You will find instructions in our YEAR-BOOK for 1876. Of course the subject could not be satisfactorily explained within the space of an answer in this column. There was, some years ago, a little pamphlet published on the subject, but it is, we think, out of print, and, at any rate, would now probably be out of date.

PAPER.—The singularly peppered condition of your pictures is beyond doubt due to the presence of some foreign body either in suspension in your bath or collodion; but what and which, it is impossible to say without investigation on the spot. We once saw a similar effect produced by the introduction of some crystals of iodide of potassium to the silver bath. You will easily see if your collodion is turbid, and if not, filter the bath carefully, and try again. 2. It is possible the sun gas-light in the roof of the interior you name may help you a little. 3. Bromide of potassium, being very insoluble in ether and alcohol, is not a desirable salt for use in your collodion. Bromide of cadmium is much more soluble, and, therefore, answers better. But no bromide or other salt should be expected to dissolve if put direct into the collodion in lump. The bromide should always be powdered, and then dissolved in separate alcohol, a drop or two of water being sometimes added. When dissolved by repeated shakings, it should be filtered before adding to the collodion. Before making collodion, if you are not familiar with the operations, you should carefully read instructions, and you would then avoid troublesome blunders.

J. C. STERNES.—The work on retouching which you name is a very excellent one.

B. L. P.—Your troublesome experience of negative films dissolving when varnish is applied is, doubtless, due to the condition of the collodion. Some samples of pyroxylene are much more soluble in alcohol than others, and some readily become so after keeping for a short time. The cutting from the *English Mechanic* which you enclose explains the case well, and doubtless meets your case. We print it for the benefit of others:—"Every one acquainted with the nature of collodion knows that, after it is iodized, a change begins, and that slowly, but surely, it decomposes. The change, so far as the pyroxylene base of the collodion is concerned, is one which tends to make it produce a more and more soluble film, till at last it is perfectly soluble in alcohol. This fully explains the dissolving of the image referred to, and it is no peculiarity of one collodion more than another; the change referred to takes place with every make of collodion, although all do not change with equal rapidity. For my own part, I have never found Mawson's collodion to behave as described if fresh, or moderately fresh—in fact, not unless very old, and in consequence much gone. Usually it keeps remarkably well. In some special cases old collodion is of particular value, and to prevent the loss of the negative when it has been used, flow over the plate diluted albumen, dry, and it may then be varnished with safety."

B. B. T.—Gelatin has of late years acquired very considerable importance as a photographic agent, and a sample specially suited to the photographer's purposes is manufactured by Messrs. Nelson and Co. Examples of gelatins vary very much in quality. Heat may be used in assisting solution, when time is an object. The completed solution may be filtered, if necessary; but not otherwise. 2. Drying the collodion-chloride film on opal glass by means of heat is desirable, but not imperatively necessary when not convenient, provided proper precautions be used to secure perfect denaturation of the film before placing it in contact with the negative. 3. The varnish known as "crystal varnish" is used without heat, and is suitable for positives on glass. 4. We know of many cases in which treatment of the bath with cyanide has been most successful. A neglect occurred in posting the packet. You have doubtless received it by this time.

HENRY WILCOX.—The Exhibition, according to the advertisements, closes on 16th November.

T. H. P.—The prints have interested us; but, being on the back of a screen in bad light, they are difficult to examine. We will make the most careful examination we can, and then give our opinion.

C. H. P. VERNON.—Thanks. Perhaps you will allow us to use the "Trip" in the NEWS. Our aim in the YEAR-BOOK is to secure chiefly practical articles.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- MEISS. G. & E. LAYIA, Eastbourne.**
Three Photographs of Bishop of Chichester.
- MR. NEVILL, Lowestoft.**
Photograph of Mrs. Brown and Child.
Photograph of St. Peter's Church, Kirkley, Lowestoft.
- MEISS. NEWBANK & FISKE, Bournemouth.**
Photograph of John Lat-rope Motley, Esq.
- MEISS. R. & J. W. BERNARD, Windermere.**
Photograph of Windermere Lake.
- MR. H. POINTON.**
Photograph entitled "Who Calls?"
Photograph entitled "Anti-Vivisection."
- MEISS. HART & CO., Birmingham.**
Two Photographs of the 4th Warwickshire Volunteers.
Our Photograph of Camp of ditto.
- DAVIES DICE, Weston-super-Mare.**
Photograph of Flat Hubs Lighthouse.
- MR. E. SHAW, Manchester.**
Photograph of Bishop of Manchester.

The Photographic News, November 2, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

AMATEUR ART CRITICS AT THE EXHIBITION—CIVIC HONOURS TO PHOTOGRAPHERS—PROFESSOR ABEL, C.B., AND MILITARY GUNCOTTON.

Amateur Art Critics at the Exhibition.—We made mention the other day in these columns of a definition of retouching: something which other people do to their pictures. We have since learnt a simple definition of art from the amateur critics who appear to visit the Pall Mall Exhibition in large numbers. Art, unlike retouching, is something in one's own picture, and in nobody else's. In sum and substance, we have heard many an exhibitor say of another photographer's work:—"It is very good, and all that; the model is cleverly arranged, and the manipulation exceedingly skilful, no doubt; indeed, so far as the technical part of the work is concerned, it is really first-rate, and deserves high commendation. But it is not art—not true art." All this is very charming and delightful, of course—especially in the case of he who utters it; the only thing is, that we do not all of us look at matters from the same standpoint. One gentleman, who shows some very fine pictures in the Exhibition, and already enjoys a recognised position in this metropolis, shook his head very dolefully as he pointed out some "flagrant abominations" to us, and only recovered his spirits again as he approached his own productions. "And which do you like best?" asked a visitor on the opening day of the Exhibition (we were standing before two fine portraits—the one a specimen of English, the other of foreign work). "This one, I think," was our opinion. "Do you—do you really?" was the reply. "Why, the other is far before it; but then I speak from an art point of view, you know." It must be very nice to enjoy such confidence in one's opinion. There is a freshness, too, and a *naivete* which never fails to amuse. One can almost imagine one of these critics getting into raptures over his own work; he does not wish to be egotistical, he would have you know, and he would much rather be dumb on his own merits, for he knows the shortcomings and defects of his work—none better; "but really, look here, you know, if those pictures of mine are not ten times—ay, twenty times—better than anything else in the show, why I'll eat my head—there." He is the man, too, of all others, who would not breathe a word against the hanging committee or the other gentlemen who have worked hard to make the exhibition a success. He knows only too well what an unprofitable and ungracious task they have had to perform, and would not for worlds take exception to their dictum, albeit they may have made, as all men are likely to do, some trifling mistakes. Errors of judgment are possible with us all, and, on the whole, the Photographic Society is certainly to be congratulated on the manner in which the whole affair has been conducted and arranged. He would be the last man to take exception to their general fitness and ability for their work, but "I ask anybody, now," he says, in an injured tone, "if those three pictures of mine deserved to be hung behind the door, or that beautiful study, entitled 'Jack and Grubby,' does not lose all its grandeur by being put where all the light in the room appears to be concentrated. I defy you to tell me which is Jack and which is Grubby from here, and yet all this rubbish round about has been hung without a thought." However, we shall see what Sir John Gilbert, R.A., and Mr. E. W. Cooke, R.A., have to say; we hope to goodness they will know something about art.

Civic Honours to Photographers.—The ninth of November is coming, and on it, two gentlemen whose names are well known in photographic circles are to be honoured in civic life. Mr. Alderman Nottage, Sheriff of London and Middlesex for the present year, shares with the Lord Mayor and his brother sheriff the honour of being host at

the banquet at the Guildhall on the occasion of the swearing in of the new first magistrate. On the same day, at Brighton, Alderman Mayall, F.C.S., F.R.M.S., will be invested with the robe of office, and assume the dignity of Mayor of Brighton. A grand banquet is to be given at the Royal Pavilion, Brighton, and it is to us a source of gratification to know that the Alderman has not forgotten his confrères in the photographic world on this occasion, but has invited several gentlemen to share his table at the moment of success. Mr. Mayall, as our readers probably know, has for some years past made Brighton his residence, and occupied himself in studying the welfare of local affairs. At the Town Council, the School Board, and other places, he has made his mark, and the scheme now being proceeded with to deepen Shoreham Harbour, and render it more available for Normandy shipping, is almost the sole work of Mr. Alderman Mayall. Brighton has shown her appreciation of his merits by bestowing upon him the highest office it is in the power of the town to award.

Professor Abel, C.B., and Military Guncotton.—It is seldom in this country that science, art, and literature are awarded a title by the State. Thackeray and Dickens neither received titles, and this was one reason, probably, why Carlisle and Tennyson hesitated to receive a baronetcy when offered to them. The President of the Royal Academy is usually knighted, as also the President of the Royal Society, as in the case of the present one, Sir Joseph Dalton Hooker. But science is rarely honoured as pure science, and, therefore, it is worth while recording the circumstance that Professor Abel, F.R.S., whose researches upon guncotton are doubtless known to every photographer, has just been nominated to the Companionship of the Bath. Only one other chemist, we believe, the Right Hon. Lyon Playfair, M.P., C.B., F.R.S., enjoys a similar honour, a remarkable circumstance, since the number of civilian C.B.'s is very great. We have just mentioned Prof. Abel's researches upon guncotton, and it is these, indeed, which have been mainly instrumental in bringing him the honour in question. Prior to his investigation of this interesting compound, guncotton was employed mainly in this country in the preparation of collodion for photographic and medical purposes. It was a soluble pyroxiline that was required, therefore, and photographers are apt to estimate the value of their pyroxiline by the readiness with which it disappears in a mixture of alcohol and ether. Prof. Abel did not want guncotton, however, for solutions; he wanted it as an explosive, as a substitute for gunpowder and the like. The photographer's guncotton is known to the chemist as bi-nitro cellulose, but Professor Abel required a material with more nitrogen, and this he secured in the shape of tri-nitro-cellulose. Both the one and the other go by the name of guncotton, and are, to the eye, undistinguishable. But both the soldier and the photographer would soon tell the difference between the bi- and the tri-nitro-cellulose. A charge of photographer's cotton would not display the same energy on explosion, and, consequently, would do less mischief than the military guncotton; while, on the other hand, if the latter were used in the preparation of collodion it would be found to be almost insoluble; at any rate, only ten or fifteen per cent. of the material would go into solution on being shaken up with an alcohol-ether mixture.

THE SCIENCE OF PHOTO-CHEMISTRY.

BY M. R. RADAU.*

[As this article appears at an opportune moment, on the death of one of the greatest English photographers, we have much pleasure in giving our readers a translation of it.—ED. P.N.]

When we study closely the action of light upon plants, we perceive that it depends essentially on chemical pheno-

* Extract from *La Lumière et les Climats*.

mena analogous to those on which photography is based. Light produces, in a great number of substances, molecular changes favourable to affinity. Unhappily, photo-chemistry, which comprises the study of all phenomena of this class, is still very little understood. We will now, however, endeavour to give briefly what is known of it.

We know that the prism separates the white light into an infinity of rays diversely coloured and refracted, which insensibly go over from red to violet, stretching through the range of the six principal colours (red, orange, yellow, green, blue, violet). These rays, which act on the retina of the eye, constitute light, more properly called visible light. They are warm, and can act chemically on substances termed *sensitive*, but they do not produce the entirety of calorific or chemical effects of the solar rays. The visible spectrum extends beyond the two sides in the form of obscure radiations. Outside the red is the region of concealed heat, outside the violet the concealed chemical rays. The latter, the *ultra-violet* rays, become visible under certain circumstances with a feeble tint of greyish-lavender. They do not possess any material heat, but they have a strong action on sensitive substances, and are transformed easily into luminous rays when thrown on a fluorescent substance.*

The luminous part of the solar spectrum is furrowed by obscure rays. They are a species of gaps, which prove the passage of rays across certain mediums endowed with a special power of absorption. The greater part of these rays are due, in all probability, to the action of the metallic vapours that envelope the sun. The spectrum infra-red, and the spectrum ultra-violet, present rays, or inactive spaces, the same as in visible spectrum. It is easy to afford evidence of this in the ultra-violet spectrum, by having recourse to photographing. In the infra-red spectrum, M. Edmond Becquerel has succeeded in rendering visible a great number of rays, profiting by the curious properties of phosphorescent bodies. The glimmer that these bodies emit, after having been exposed to light, is destroyed by the obscure heat rays; the parts of the phosphorescent surface which correspond to the inactive spaces of an obscure spectrum then continue only to shine, and thus reveal the existence of rays.† All these rays or spaces have otherwise perfectly invariable positions in the spectrum, and it is this fixedness which furnishes us with a valuable mark by defining in a precise manner the thermo-colouration, optical or chemical, of a ray; we employ the word *colouration* as customary in physics to design the place that a ray, visible or not, occupies in the complete spectrum.

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At last, towards 1839, Talbot introduced the use of chloride of silver. From that time photography has made gigantic strides, but only as regards application, the theory of its phenomena being still enveloped in obscurity. We can, however, attempt to group what has been done, under many general heads. First, we have reducing actions. Under the influence of the solar rays, oxygen and halogenous bodies tend to leave metals: chloride and nitrate of silver are decomposed. It is the same with chlorides, bromides, iodides, and cyanides of metals, which are easily oxidized, and the oxides or acids which are over-oxidized, &c. In these cases light destroys affinity.

There are, again, the combining actions, in which affinities are, on the other hand, developed by light. Oxygen, chlorine, and bromine tend under this influence to mix with hydrogen and organic substances. A mixture of chlorine and hydrogen keeps indefinitely in the dark; exposed to the light it liquefies, and hydrochloric acid is produced. Bitumen of Judea becomes insoluble under the action of light, on account of its absorbing oxygen. A great number of essences and varnishes become equally oxidized in the light; the resin of the guaiacum or lignum vitæ turns blue, at the same time that it oxidizes.

In mixing a substance that readily decomposes under the action of light with another possessing a tendency to absorb intervening bodies, we obtain still more energetic effects. Thus it is that organic substances tend to facilitate the reduction of salts of silver, while they absorb the oxygen disengaged. But what is most remarkable is, that it suffices to expose one only of the two sensitive substances to the sun, and afterwards to put it into contact with the other; the molecular work developed by light continues after the exposure, and the union of the two substances produces in the end the same effect as would have taken place under the direct action of the solar rays. Thus, for example, to facilitate the reduction of iodide of silver, we bring it into contact with gallic acid, after having exposed one or other of the two substances to the sun, or we may expose the two together: the effect is always the same, so far as intensity is concerned. The photographers term materials that receive and preserve the luminary action, *sensitive or impressionable*; and those which develop or complete the chemical effect, *developing substances*; but these distinctions carry with them little weight, as we can easily change the characters of the two bodies.

(To be continued.)

ON THE SAVING OF SILVER.

BY ROBERT J. CHUTE.*

It is a trite saying that "it is not so much what a man earns as what he saves," and as the margin for saving or wasting in photography is so large, the matter of saving becomes an important one.

It is well known among photographers that but a very small percentage of the silver used remains in the finished negative or print, and yet it is surprising to see how careless many are in their handling of the precious material, and how little effort is made to save, where saving is possible, or where it is no more trouble to save than to waste.

Men are governed mainly, no doubt, by their interest in this matter, and unless one has had a thorough training in economical methods, or has a prospect of personal benefit in the result, he will waste as soon as save.

Most proprietors of galleries are disposed to practise saving, but the difficulty is in getting help to look to their

* Philadelphia Photographer.

employer's interest in this direction when it requires a little more care or an extra step to do it. The best plan I believe for all concerned would be, to make those who handle silver interested in saving by giving them a percentage of all they save. The man who has been in business for himself, and practised this kind of economy, requires no inducements, as it has become to him a duty which forms a part of his daily practice.

The methods for saving silver vary with different operators, each adopting that which seems best adapted to his situation and the amount of silver used. The necessity for watchfulness and care commences with the first handling of the crystal nitrate, to see that no grains are scattered on the floor, and that clean dry paper is used in the scales in weighing it out.

In making a bath the bottle should be placed on a broad sheet of paper (an old newspaper will answer), to catch any drops or drippings that might otherwise go on the floor. One will be surprised to see in a short time how this paper will be stained. It should always be used when the bath is filtered, and the bottles kept on it. In pouring into the filter, or from one vessel to another, care should be taken to catch the last drop, otherwise this last drop runs down the side, and in handling the bottle the hands are sure to be stained. Some may experience difficulty in decanting the solution from a glass bath without waste. If not too large to be handled conveniently, it may be poured from one side with perfect safety, by pasting a little strip of albumen paper close to the top of the bath where the solution is to be poured out, or a small cord tied round the bath near the top will serve the same purpose.

In the dark room the shelves should be covered with paper, and especially near the holders, where it is well to keep a sheet of thick blotting-paper. If the holders be fitted with bottles, and plates used the full size of the holders, these may catch the drippings well, if care and attention are exercised; but in the hurry of work they are unreliable, and much silver is lost. A bottle of the right shape has never yet been used. The only one ever made for the purpose is the traditional one with a hole in one end, which is always more ready to let the solution slop out than to let it go in. A bottle with the opening in the centre and a slight neck to it would be free from the objections which have consigned the present style to almost entire disuse. But the cleanest way of working is, no doubt, to prevent any dripping from the plate. This is done by draining the plate well as it comes from the bath, then wiping the back till there is no solution to run. The plate being held on its edge on a sheet of blotting-paper during this operation, the solution drains from the film side, and when the plate is placed in the holder, a little strip of blotting-paper under each corner will absorb all further drainage. Instead of wiping the back of the plate, it may save time to have a piece of blotting-paper the size of the plate to place against it immediately it is put in the holder. Keeping the holder in a horizontal position while it is being carried from the dark-room to the camera is also a preventive of dripping.

The practice of these methods may, from the recital of them, seem too troublesome to pay, but they are not really so when once they are put in practice and adhered to. They not only save a sufficient amount of silver to pay for the trouble, but they prevent the gallery from assuming the unsightly appearance which is the result of a loose and indiscriminate dripping, and from which the operator himself usually carries, both on his clothes and his person, the indelible evidences of his profession and slovenliness.

The next important point for saving is in the development, and here various methods are used. In the early days of photography, when many of its votaries, doing business in a small way, were obliged to carry their water from a pump in the yard to the third or fourth storey, the washings were all collected in a tub, and every

day the waste water drawn off, to be carried down as it had been brought up, or emptied out on the roof, to find its way to the ground by the conductors. These tubs formed excellent silver savers, though their real value was hardly then appreciated; and something of the same sort answers the purpose admirably now. Where a large business is done a large tank should, of course, be used, and where there is not room to place it under the developing-tank in the dark-room, it should be placed in a room below, or in the yard outside, if the climate be not too cold in winter, with a pipe leading to it. Over this tank the negatives are developed, and washed just enough to clear them of the developer and whatever surplus silver may be on the plate. Into this tank all washings of vessels that have contained silver solutions are poured. The developer is unusually sufficient to precipitate all the silver, and by a waste pipe attached to the tank the clear water can be drawn off every morning, or when the tank is full, provided it does not fill more than once a day. Where a small business is done, a large dish or wooden tray may be used for the developer washings, or a developing-tank constructed with separate apartments, one of which shall be used for this purpose. Into such a tank, or a separate dish, all the films from waste plates should be scraped while they are still wet.

The hypo fixing bath for negatives becomes well charged with silver after a time, and if well cared for will yield a good return. When this bath shows signs of failing—which are usually spots on the negative after fixing, though they are not of such a nature as to show in printing—it should be poured into a large bottle or earthen pot (a wooden tub or butter skin will do), and as it becomes full, add a quantity of a solution of sulphuret of potash, stir well, and let settle; the clear part may then be decanted, and the vessel filled again in the regular order of business.

As this completes the routine in the negative department, I will not extend this article, but leave the methods for saving silver and gold in connection with the printing, to be discussed in another paper.

THE MATHEMATICS OF PIGMENT PRINTING.

BY FOCO MAS.*

By way of addenda to my paper on Photometers, I ought to say something about the preparation and use of the sensitive albumen paper.

A very wide range in the strength of the silver bath is allowable—usually from forty to sixty grains to the ounce, with the addition of from two to fifteen grains citric acid, according to temperature and hygrometric conditions. The higher the temperature the more citric acid must be used. It keeps the paper white and pure, so that the tints of the photometer are readily and clearly distinguished. The farther south, the more citric acid, of course; and the higher the latitude, the less of the citric acid.

A very important matter to carbon printing, and one into which a great deal of confusion has been thrown, is the arbitrarily fixed strength of the

Bichromate Bath.—One puts 5:100, another 4:100, and still another 3:100, and yet another 1½:100. Now, if the negatives are suited to these widely differing baths, one will produce as good prints as another. Mr. Milner's bath of six grains to the ounce, upon which he so strongly insists as the best, doubtless is the best suited to his negatives; but his neighbour's negatives require, perhaps, a bath of sixteen or twenty grains to the ounce. It proves only that Mr. Milner's negatives are thin, like his bath. Strong negatives require strong baths, and weak ones weak baths. I have in a few instances been obliged to sensitize my tissue on baths of only three grains to the ounce, and, again, I have had to use as much as twenty-

* St. Louis Practical Photographer.

mena analogous to those on which photography is based. Light produces, in a great number of substances, molecular changes favourable to affinity. Unhappily, photo-chemistry, which comprises the study of all phenomena of this class, is still very little understood. We will now, however, endeavour to give briefly what is known of it.

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Most proprietors of galleries are disposed to preserve, but the difficulty is in getting help to look to

* Philadelphia Photographer.

of the metropolis. There are not wanting contributors whose skill in picturesque composition proves them to be artists who only employ the sun to draw for them. On entering the gallery at 5A, Pall Mall East, we feel at a glance how simply the magic ray, nature's own reporter, renders the broad effects of features or of landscape, and refuses to force details into unpleasant conspicuousness, and as we examine the pictures we realise how much beauty must perish unrecorded but for this art. It is a pleasure to know that these portraits are true portraits—that individuality has not been rounded off for the sake of mere prettiness, and that these forest glades are not all an artist's dream. An artist gives us what photography cannot possess—the image of nature in the soul of a poet, expressed with a touch in itself fascinating; but many painters aim simply to copy nature, and receiving her image only on the eye, and labouring to imitate it with paint and pencil, produce nothing better than an appearance of paint and pains. To this class of works the superiority of a photograph is undeniable. For artists the most valuable photographs are those produced upon a single plate. When the attention, as we may call it, of the lens is fixed upon a face or figure with a background of more distant objects, these inevitably appear indistinct or blurred. The lens thus illustrates what has been happily called the perspective of the mind, and renders in a sketchy manner whatever is remote from the principal subject. Several studies by Mrs. H. E. Roscoe possess this quality.—“Morning Light, Evening Light, and The Stonebreakers;” also Mr. Frederick Hollyer's rustic studies from nature. A grand example is found in a large view of Windsor Castle—a carbon enlargement by the Autotype Company. The foreground and the distant castle and luminous sky are in true harmony. It would seem that photographers do not always appreciate the fidelity of the camera in refusing to render all parts of a scene with equal force, for we find many mosaic pictures often skilfully composed for the sake of expressing a subject, sometimes to supply a sky where the exposure of the plate sufficient for sea or landscape has not been long enough to produce an impression of the luminous clouds. It may be questioned whether skies thus separately photographed are in harmony with the ground. Colonel Stuart Wortley's compositions illustrate the difficulties of connecting separate impressions. He contributes valuable transcripts of sea and clouds. To have caught the clouds in their flight, and snatched the curl of the waves breaking into foam, is a service to all who study clouds and waves; but in connecting a sea study with a cloud study the laws of reflection have not been observed. Some photographers—close observers of the harmony of nature—have succeeded in piecing together various impressions, so as to portray a subject with all the charm of artistic composition. Mr. R. Slingsby has thus produced an effective picture called “Alone”—a beautiful girl, resting on a bank among low shrubs, overlooking the sea. Every line of the composition is harmonious, and the balance of light and shade most pleasing. The conception of such a subject is equally artistic, whether expressed by the pencil or in the photographic camera. Mr. A. Ford Smith has a group of children, “Birdnesting.” He has had the advantage of pretty girls, and has known well how to pose them. The landscape beyond is also well chosen, and combines well with the foreground; but it is nevertheless more distinctly pencilled than it would appear as background to the cluster of young faces. The advantages of photography are realised in the accurate portraiture of distant lands, their people, and their architecture. Messrs. Stillfried and Andersen send skilfully-treated studies from Japan. The physiognomy of “An Old Man,” “An Old Gentleman,” “A Young Girl,” and “Young Ladies” is most interesting. There are also street scenes and interiors, which bring before us the details of a life novel to Europeans. Mr. Kirsch has recorded the personal appearance of the Cape Kafir, adding to our knowledge of foreign life and the appreciation of our own. Mr. C. Klary illustrates the graceful dress and interesting types of Algerine people. Mr. G. Nesbitt has produced a delightful picture called “Tired Companions”—a grand old dog and pretty child asleep together on the floor. The group is rendered in pleasant tone, and the lighting carefully studied. The same qualities are found in Mr. Nesbitt's “Bob and His Two Sisters”—fine dogs. Among Mr. A. Boucher's studies is one of a lady in a dress of soft muslin, with many folds and plaitings. The details of the white masses are rendered with unusual delicacy. “A Quiet Cup of Tea,” by Mr. Q. M. Young, is a

fine imitation in English subjects the style of a Dutch interior. Bernard Mischewski contributes several large portraits, which realise all that photography can attain. We prefer No. 296, on account of the grace of pose and lighting of the subject. The features are rendered in that half-tint best adapted to the subtle gradations of form, and light falls upon the neck and a too bright string of beads—the only blemish. No. 387—another portrait by Mr. Mischewski—is magnificent in tone, but the impression has been somewhat retouched. Many photographs are injured by an attempt to brighten the eyes and define contours which should melt into nothing. Da Vinci or Correggio would not have corrected a photograph for leaving the contours undefined. “Clarissa,” by Valentine Blanchard, is most artistically draped and posed. The attention is filled with the expressive face, and the less interesting material of the picture is only sketched. A glance at a case of 75 portraits of children convinces us that they were taken instantaneously, so unaffected are the attitudes of the little sprites, caught like birds on the wing. Mr. Faulkner's enlargements of these instantaneous pictures are very satisfactory. On the table we find the photographs taken during the Arctic expedition under Sir G. Nares; facsimiles of ancient manuscripts, of the “Common Place Book” of John Milton, of ancient coins and Roman medallions, all the admirable and unfading productions of the Autotype Company. We are grateful to Mr. Milman Brown for “A Glen Study,” an avenue of rare beauty. Mr. Gutekunst sends from Philadelphia views of the Centennial buildings, and portraits of peculiar delicacy on porcelain. One is Longfellow, and in the same frame a smaller likeness of an aged Quakeress, the eloquent philanthropist, Lucretia Mott. The specimens of their art produced by the Royal Engineers' School of Photography do not need that we should call attention to them, and many other works, too numerous to mention, make the walls of this gallery attractive, either by novelty of foreign scenes, or the dear familiarity of English landscapes.

[From the MORNING POST.]

VIEWED collectively, the present exhibition of the Photographic Society is eminently creditable to the exhibitors. The sun-limned pictures, more numerous than on any former occasion, are in all varieties of style and subject, and among them will be found many works of remarkable beauty. It is satisfactory to observe that, many and meritorious as are the photographs contributed by foreign artists, more particularly by Germans and Americans, the English photographers hold their own against all competition, and worthily sustain the high reputation of the British school. Colonel H. Stuart Wortley's sea studies are unsurpassed for truthful expression of the tremulous action of water, for accurate delineation of all forms of vegetation on the foreshore for picturesque arrangement of clouds, and for splendour and variety of atmospheric effects. Mr. H. P. Robinson, of Tunbridge Wells, is famous for his skill in composition and his masterly treatment of light and shade. His merits in these, as indeed in many other respects, are displayed to brilliant advantage in one of the best pictures in the gallery, that entitled “When the Day's Work is Done”—a cottage interior, with an old man reading the Bible, while his wife, of equal antiquity, keeps solemnly knitting. A variety of picturesque landscapes, by members of the Royal Engineers' School of Photography; views in Switzerland and elsewhere, executed from dry plates, by Mr. W. Eng'land; Welsh landscapes, by Mr. Robert Crawshaw, of Cyfarthfa Castle; Arctic views, by Mr. J. A. Grant; studies of horses, by Mr. D. Hedges, and of cats by Mr. H. Pointer; portrait studies by Mr. Valentine Blanchard, Mr. Jean Baptiste Frilner, Mr. Taeschler, Mr. A. Boucher, and Mr. Carlo Relvas; and numerous works in the departments of scenery, genre, and portraiture by Messrs. Beasley, Jun. Bowness, Faulkner and Co., G. Nesbitt, H. B. Pritchard, C. Klary, R. Slingsby, J. Hawke, R. V. Harman, James Howie, Payne Jennings, M. Kiech, and the Autotype and Woodbury Companies may be commended to the special attention of the visitor. Upon the table will be found a very interesting collection of photographs taken during the Arctic Expedition under Sir G. Nares, and lent for exhibition by the Lords of the admiralty.

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There are, again, the combining actions, in which affinities are, on the other hand, developed by light. Oxygen, chlorine, and bromine tend under this influence to mix with hydrogen and organic substances. A mixture of chlorine and hydrogen keeps indefinitely in the dark; exposed to the light it liquefies, and hydrochloric acid is produced. Bitumen of Judea becomes insoluble under the action of light, on account of its absorbing oxygen. A great number of essences and varnishes become equally oxidized in the light; the resin of the guaiacum or lignum vitæ turns blue, at the same time that it oxidizes.

In mixing a substance that readily decomposes under the action of light with another possessing a tendency to absorb intervening bodies, we obtain still more energetic effects. Thus it is that organic substances tend to facilitate the reduction of salts of silver, while they absorb the oxygen disengaged. But what is most remarkable is, that it suffices to expose one only of the two sensitive substances to the sun, and afterwards to put it into contact with the other; the molecular work developed by light continues after the exposure, and the union of the two substances produces in the end the same effect as would have taken place under the direct action of the solar rays. Thus, for example, to facilitate the reduction of iodide of silver, we bring it into contact with gallic acid, after having exposed one or other of the two substances to the sun, or we may expose the two together: the effect is always the same, so far as intensity is concerned. The photographers term materials that receive and preserve the luminary action, *sensitive or impressionable*; and those which develop or complete the chemical effect, *developing substances*; but these distinctions carry with them little weight, as we can easily change the characters of the two bodies.

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It is well known among photographers that but a very small percentage of the silver used remains in the finished negative or print, and yet it is surprising to see how careless many are in their handling of the precious material, and how little effort is made to save, where saving is possible, or where it is no more trouble to save than to waste.

Men are governed mainly, no doubt, by their interest in this matter, and unless one has had a thorough training in economical methods, or has a prospect of personal benefit in the result, he will waste as soon as save.

Most proprietors of galleries are disposed to practise saving, but the difficulty is in getting help to look to their

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employer's interest in this direction when it requires a little more care or an extra step to do it. The best plan I believe for all concerned would be, to make those who handle silver interested in saving by giving them a percentage of all they save. The man who has been in business for himself, and practised this kind of economy, requires no inducements, as it has become to him a duty which forms a part of his daily practice.

The methods for saving silver vary with different operators, each adopting that which seems best adapted to his situation and the amount of silver used. The necessity for watchfulness and care commences with the first handling of the crystal nitrate, to see that no grains are scattered on the floor, and that clean dry paper is used in the scales in weighing it out.

In making a bath the bottle should be placed on a broad sheet of paper (an old newspaper will answer), to catch any drops or drippings that might otherwise go on the floor. One will be surprised to see in a short time how this paper will be stained. It should always be used when the bath is filtered, and the bottles kept on it. In pouring into the filter, or from one vessel to another, care should be taken to catch the last drop, otherwise this last drop runs down the side, and in handling the bottle the hands are sure to be stained. Some may experience difficulty in decanting the solution from a glass bath without waste. If not too large to be handled conveniently, it may be poured from one side with perfect safety, by pasting a little strip of albumen paper close to the top of the bath where the solution is to be poured out, or a small cord tied round the bath near the top will serve the same purpose.

In the dark room the shelves should be covered with paper, and especially near the holders, where it is well to keep a sheet of thick blotting-paper. If the holders be fitted with bottles, and plates used the full size of the holders, these may catch the drippings well, if care and attention are exercised; but in the hurry of work they are unreliable, and much silver is lost. A bottle of the right shape has never yet been used. The only one ever made for the purpose is the traditional one with a hole in one end, which is always more ready to let the solution slop out than to let it go in. A bottle with the opening in the centre and a slight neck to it would be free from the objections which have consigned the present style to almost entire disuse. But the cleanest way of working is, no doubt, to prevent any dripping from the plate. This is done by draining the plate well as it comes from the bath, then wiping the back till there is no solution to run. The plate being held on its edge on a sheet of blotting-paper during this operation, the solution drains from the film side, and when the plate is placed in the holder, a little strip of blotting-paper under each corner will absorb all further drainage. Instead of wiping the back of the plate, it may save time to have a piece of blotting-paper the size of the plate to place against it immediately it is put in the holder. Keeping the holder in a horizontal position while it is being carried from the dark-room to the camera is also a preventive of dripping.

The practice of these methods may, from the recital of them, seem too troublesome to pay, but they are not really so when once they are put in practice and adhered to. They not only save a sufficient amount of silver to pay for the trouble, but they prevent the gallery from assuming the unsightly appearance which is the result of a loose and indiscriminate dripping, and from which the operator himself usually carries, both on his clothes and his person, the indelible evidences of his profession and slovenliness.

The next important point for saving is in the development, and here various methods are used. In the early days of photography, when many of its votaries, doing business in a small way, were obliged to carry their water from a pump in the yard to the third or fourth storey, the washings were all collected in a tub, and every

day the waste water drawn off, to be carried down as it had been brought up, or emptied out on the roof, to find its way to the ground by the conductors. These tubs formed excellent silver savers, though their real value was hardly then appreciated; and something of the same sort answers the purpose admirably now. Where a large business is done a large tank should, of course, be used, and where there is not room to place it under the developing-tank in the dark-room, it should be placed in a room below, or in the yard outside, if the climate be not too cold in winter, with a pipe leading to it. Over this tank the negatives are developed, and washed just enough to clear them of the developer and whatever surplus silver may be on the plate. Into this tank all washings of vessels that have contained silver solutions are poured. The developer is unusually sufficient to precipitate all the silver, and by a waste pipe attached to the tank the clear water can be drawn off every morning, or when the tank is full, provided it does not fill more than once a day. Where a small business is done, a large dish or wooden tray may be used for the developer washings, or a developing-tank constructed with separate apartments, one of which shall be used for this purpose. Into such a tank, or a separate dish, all the films from waste plates should be scraped while they are still wet.

The hypo fixing bath for negatives becomes well charged with silver after a time, and if well cared for will yield a good return. When this bath shows signs of failing—which are usually spots on the negative after fixing, though they are not of such a nature as to show in printing—it should be poured into a large bottle or earthen pot (a wooden tub or butter firkin will do), and as it becomes full, add a quantity of a solution of sulphuret of potash, stir well, and let settle; the clear part may then be decanted, and the vessel filled again in the regular order of business.

As this completes the routine in the negative department, I will not extend this article, but leave the methods for saving silver and gold in connection with the printing, to be discussed in another paper.

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By way of addenda to my paper on Photometers, I ought to say something about the preparation and use of the sensitive albumen paper.

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mena analogous to those on which photography is based. Light produces, in a great number of substances, molecular changes favourable to affinity. Unhappily, photo-chemistry, which comprises the study of all phenomena of this class, is still very little understood. We will now, however, endeavour to give briefly what is known of it.

We know that the prism separates the white light into an infinity of rays diversely coloured and refracted, which insensibly go over from red to violet, stretching through the range of the six principal colours (red, orange, yellow, green, blue, violet). These rays, which act on the retina of the eye, constitute light, more properly called visible light. They are warm, and can act chemically on substances termed *sensitive*, but they do not produce the entirety of calorific or chemical effects of the solar rays. The visible spectrum extends beyond the two sides in the form of obscure radiations. Outside the red is the region of concealed heat, outside the violet the concealed chemical rays. The latter, the *ultra-violet* rays, become visible under certain circumstances with a feeble tint of greyish-lavender. They do not possess any material heat, but they have a strong action on sensitive substances, and are transformed easily into luminous rays when thrown on a fluorescent substance.*

The luminous part of the solar spectrum is furrowed by obscure rays. They are a species of gaps, which prove the passage of rays across certain mediums endowed with a special power of absorption. The greater part of these rays are due, in all probability, to the action of the metallic vapours that envelope the sun. The spectrum infra-red, and the spectrum ultra-violet, present rays, or inactive spaces, the same as in visible spectrum. It is easy to afford evidence of this in the ultra-violet spectrum, by having recourse to photographing. In the infra-red spectrum, M. Edmond Becquerel has succeeded in rendering visible a great number of rays, profiting by the curious properties of phosphorescent bodies. The glimmer that these bodies emit, after having been exposed to light, is destroyed by the obscure heat rays; the parts of the phosphorescent surface which correspond to the inactive spaces of an obscure spectrum then continue only to shine, and thus reveal the existence of rays.† All these rays or spaces have otherwise perfectly invariable positions in the spectrum, and it is this fixedness which furnishes us with a valuable mark by defining in a precise manner the thermo-colouration, optical or chemical, of a ray; we employ the word *colouration* as customary in physics to design the place that a ray, visible or not, occupies in the complete spectrum.

The chemical action of light has been mainly studied in view of a practical end—the fixing of the image in the dark room or camera. We have discovered that a great number of substances change colour when they are exposed to certain luminous rays, and this fact, admitted without having been investigated, has served as the turning point to the art of photography.

Scheele has made it known since 1770 that chloride of silver turned black under the action of daylight. Wedgwood, in 1802, tried to use this property of chloride of silver for copying church windows or engravings, but he did not succeed. About 1813 Joseph Nicéphore Niepce carried on the researches, and succeeded in copying engravings by means of a layer of bitumen of Judea placed on a plate of burnished silver; the portions of bitumen attacked by the solar rays become insoluble, and, on being plunged into essence of lavender, the parts protected can be washed away, leaving thus the bare metal, with its burnished aspect, for those parts that the engraving has covered, whilst the whites of the engraving are represented by a whitish coating of bitumen.

* Let it here be added that, according to Mr. Draper, the small calorific intensity of the violet region of the spectrum is accounted for mainly by the considerable expansion it is submitted to in crossing the prism.

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four grains, the negatives being so widely different in their densities; so that you must at first find out for yourself, by experiment, the strength of bichromate bath best suited to your negatives, just as you do in silver printing, only with this difference: the weaker the negative the stronger the silver bath, and the stronger the negatives the weaker the silvering—while in carbon printing the opposite of this is the rule: the weaker the negative the weaker the bath should be. An important condition in this respect is the

Temperature.—The higher the temperature, the weaker must be the bichromate of potash bath. If the temperature of the air in which you print is 60° Fahrenheit, and a bath of 16 grains bichromate is suitable, what must be the strength of the bath when the thermometer stands at 100°? How do you come at that? Answer: 12½ grains. And the reverse: what must be the strength, when the thermometer is at 32°? Answer: 22 grains.

Rule.—Diminish the strength of the bath as the square root of the degrees of temperature.

Thus, if known that a bath of 16 grains is right at a temperature of 60°, then at

Degrees—0°	32°	60°	75°	90°	100°
Grains—40	22	16	14½	13	12½

But if 12 grains, at a temperature of 60° is right, then, for the same degrees, the strength of the bichromate bath will range—

Degrees—0°	32°	60°	75°	90°	100°
Grains—30	16½	12	10½	10	9

The negative being the same, all these baths will produce at the given temperatures exactly similar results.

This rule, now for the first time published, as far as I am aware of, will enable carbon printers to graduate the strength of their baths to the season of the year, to the latitude of their several localities, and to the decreasing or advancing temperature; so that whilst I, in latitude 33° North, am using a 6-grain bath, Allen and Rowell, of Boston, will be using one of 9 grains; Inglis, of Montreal, one of 10 grains; the Autotype Company, London, one of 15 grains, and Mr. What-d'-ye-call-'m (Zastezunski), on the shores of the Baltic Sea, one of 24 grains. And, although so different, the negatives being similar, the results would be exactly the same.

When a bath is too strong for the negative, the print will be weak, flat, and poor looking. When the bath is too weak, the half tints wash away in developing, or the contrasts are too violent, and "hardness" is the result—and this, too, if only a little too weak. Also, if the bath is just a little too strong, it tends to the production of a granular appearance, seen best in half tint and in the middle tints of flesh.

Another thing in connection with the bichromate bath: the stronger the bath, the quicker the printing, and this, too, in an exact mathematical ratio. If a bichromate bath of twelve grains take twelve minutes to print, one of six grains will take seventeen minutes, and one of three grains twenty-four minutes, one of fifteen grains a fraction over ten minutes, and so on.

So it will be seen that it is desirable to have moderately dense negatives, and to use as strong a bath as possible, so as to economize time in printing.

The foregoing will account for many failures in the carbon process hitherto met with, and a careful consideration of the rules given will enable carbon workers to secure a nicer adjustment of their material, and so arrive at better and more uniform results.

Cost of Production.—One writer in England puts it at one shilling and sixpence per dozen cartes—equal to 33 cents. The cost of tissue there is seven shillings per roll—equal to \$1.54; while in the United States the same tissue costs

\$3.25. The cost of a dozen cartes in this country is about two and a-half times what it is in England, or 82½ cents—about three times the cost of silver printing. This is the great bar in the way of the more general adoption of the carbon process, and it is altogether likely that, until all embargoes are taken off the process in the way of patents and manufacturing monopolies, it will be practised only by the very few. Until such time, it is altogether reasonable to believe that it will never become general, like the albumen process of to-day, on account of the enhanced cost of production. The public are not willing, either, to pay more for carbon prints than for albumen photographs. The great unwashed multitude see no reason for it, as they are able to see but little if any difference in pictures by the two processes. There are a few persons in every community—of refined and highly cultivated tastes—who, to the fine arts, are the very salt of the earth. They at once see a great difference, and are ready at sight of good samples of carbon work to pay a reasonable difference in price. But this class are too few in numbers everywhere by which to gauge a schedule.

Swan's patent, which covers the manufacture of tissues, soon expires. Johnson's patent, practically, expired years ago. It was rendered obsolete by other and better contrivances, and photographers everywhere, whether now interested in carbon or not, should see to it that Swan's patent be not renewed. Then we should have cheaper and better tissues, because individual taste, ingenuity, and enterprise, stimulated by competition more or less sharp, would accomplish many things for the process and fraternity which the Autotype Company, enjoying a sole monopoly, see no commercial reason to aim at. One of these things I, as well as others, both in Europe and America, have been hoping and waiting for for years, and it is generally believed by carbon workers to be both practicable and feasible, and that is, the same play of colour in the pigment print that is seen in a splendidly toned albumen photograph. The tone of a carbon print—whether an autotype or one made by either Monsieur Lam-bear or any of his licensees—is solid purple throughout, from the most delicate demi-tint to the deepest shadow; while an albumen photograph has a beautiful play of colour. The deep shadows are a warm chocolate brown, the lighter shadows cooler, and the delicate demi-tints a purplish grey; and in this one respect the albumen process has immensely the advantage of pigment printing. Until this one quality is secured for the carbon process we cannot rest entirely satisfied and contented with it. Who will give us this last and final touch to the pigment print, making the process complete and perfect in every particular—untrammelled and unfettered by a patent? To such a man we will give a gold medal worth ten thousand dollars, and vote him a statue at his death. Fanciful as this may seem now, this final and crowning touch to the carbon process will come sooner or later, and until that time the carbon processes of the present—autotype or chromotype—must of necessity be regarded as incomplete. So, photographers, lay by your \$100 gold until that time, and in the meanwhile make yourselves acquainted with the practical manipulations of the autotype process, so as at once to jump into that completed process in carbon when it comes along.

(To be continued.)

THE PHOTOGRAPHIC EXHIBITION.

[From the STANDARD.]

As the truthful pencil of photography has been employed in the interests of art and science to record the beautiful in landscape and in physiognomy, to note the changing phases of an eclipse, the strange fields of Arctic explorations and of distant countries, it is not without reason that the Photographic Society claims to exhibit among the art galleries

of the metropolis. There are not wanting contributors whose skill in picturesque composition proves them to be artists who only employ the sun to draw for them. On entering the gallery at 5A, Pall Mall East, we feel at a glance how simply the magic ray, nature's own reporter, renders the broad effects of features or of landscape, and refuses to force details into unpleasant conspicuousness, and as we examine the pictures we realise how much beauty must perish unrecorded but for this art. It is a pleasure to know that these portraits are true portraits—that individuality has not been rounded off for the sake of mere prettiness, and that these forest glades are not all an artist's dream. An artist gives us what photography cannot possess—the image of nature in the soul of a poet, expressed with a touch in itself fascinating; but many painters aim simply to copy nature, and receiving her image only on the eye, and labouring to imitate it with paint and pencil, produce nothing better than an appearance of paint and pains. To this class of works the superiority of a photograph is undeniable. For artists the most valuable photographs are those produced upon a single plate. When the attention, as we may call it, of the lens is fixed upon a face or figure with a background of more distant objects, these inevitably appear indistinct or blurred. The lens thus illustrates what has been happily called the perspective of the mind, and renders in a sketchy manner whatever is remote from the principal subject. Several studies by Mrs. R. E. Roscoe possess this quality.—“Morning Light, Evening Light, and The Stonebreakers;” also Mr. Frederick Hollyer's rustic studies from nature. A grand example is found in a large view of Windsor Castle—a carbon enlargement by the Autotype Company. The foreground and the distant castle and luminous sky are in true harmony. It would seem that photographers do not always appreciate the fidelity of the camera in refusing to render all parts of a scene with equal force, for we find many mosaic pictures often skilfully composed for the sake of expressing a subject, sometimes to supply a sky where the exposure of the plate sufficient for sea or landscape has not been long enough to produce an impression of the luminous clouds. It may be questioned whether skies thus separately photographed are in harmony with the ground. Colonel Stuart Wortley's compositions illustrate the difficulties of connecting separate impressions. He contributes valuable transcripts of sea and clouds. To have caught the clouds in their flight, and snatched the curl of the waves breaking into foam, is a service to all who study clouds and waves; but in connecting a sea study with a cloud study the laws of reflection have not been observed. Some photographers—close observers of the harmony of nature—have succeeded in piecing together various impressions, so as to portray a subject with all the charm of artistic composition. Mr. R. Slingsby has thus produced an effective picture called “Alone”—a beautiful girl, resting on a bank among low shrubs, overlooking the sea. Every line of the composition is harmonious, and the balance of light and shade most pleasing. The conception of such a subject is equally artistic, whether expressed by the pencil or in the photographic camera. Mr. A. Ford Smith has a group of children, “Birdnesting.” He has had the advantage of pretty girls, and has known well how to pose them. The landscape beyond is also well chosen, and combines well with the foreground; but it is nevertheless more distinctly pencilled than it would appear as background to the cluster of young faces. The advantages of photography are realised in the accurate portraiture of distant lands, their people, and their architecture. Messrs. Stillfried and Andersen send skilfully-treated studies from Japan. The physiognomy of “An Old Man,” “An Old Gentleman,” “A Young Girl,” and “Young Ladies” is most interesting. There are also street scenes and interiors, which bring before us the details of a life novel to Europeans. Mr. Kirsch has recorded the personal appearance of the Cape Kafirs, adding to our knowledge of foreign life and the appreciation of our own. Mr. C. Klary illustrates the graceful dress and interesting types of Algerine people. Mr. G. Nesbitt has produced a delightful picture called “Tired Companions”—a grand old dog and pretty child asleep together on the floor. The group is rendered in pleasant tone, and the lighting carefully studied. The same qualities are found in Mr. Nesbitt's “Bob and His Two Sisters”—fine dogs. Among Mr. A. Boucher's studies is one of a lady in a dress of soft muslin, with many folds and plaitings. The details of the white masses are rendered with unusual delicacy. “A Quiet Cup of Tea,” by Mr. Q. M. Young, is a

fine imitation in English subjects the style of a Dutch interior. Bernard Mischewski contributes several large portraits, which realise all that photography can attain. We prefer No. 296, on account of the grace of pose and lighting of the subject. The features are rendered in that half-tint best adapted to the subtle gradations of form, and light falls upon the neck and a too bright string of beads—the only blemish. No. 387—another portrait by Mr. Mischewski—is magnificent in tone, but the impression has been somewhat retouched. Many photographs are injured by an attempt to brighten the eyes and define contours which should melt into nothing. Da Vinci or Correggio would not have corrected a photograph for leaving the contours undefined. “Clarissa,” by Valentine Blanchard, is most artistically draped and posed. The attention is filled with the expressive face, and the less interesting material of the picture is only sketched. A glance at a case of 75 portraits of children convinces us that they were taken instantaneously, so unaffected are the attitudes of the little sprites, caught like birds on the wing. Mr. Faulkner's enlargements of these instantaneous pictures are very satisfactory. On the table we find the photographs taken during the Arctic expedition under Sir G. Nares; facsimiles of ancient manuscripts, of the “Common Place Book” of John Milton, of ancient coins and Roman medallions, all the admirable and unfading productions of the Autotype Company. We are grateful to Mr. Milman Brown for “A Glen Study,” an avenue of rare beauty. Mr. Gutekunst sends from Philadelphia views of the Centennial buildings, and portraits of peculiar delicacy on porcelain. One is Longfellow, and in the same frame a smaller likeness of an aged Quakeress, the eloquent philanthropist, Lucretia Mott. The specimens of their art produced by the Royal Engineers' School of Photography do not need that we should call attention to them, and many other works, too numerous to mention, make the walls of this gallery attractive, either by novelty of foreign scenes, or the dear familiarity of English landscapes.

[From the MORNING POST.]

VIEWED collectively, the present exhibition of the Photographic Society is eminently creditable to the exhibitors. The sun-limned pictures, more numerous than on any former occasion, are in all varieties of style and subject, and among them will be found many works of remarkable beauty. It is satisfactory to observe that, many and meritorious as are the photographs contributed by foreign artists, more particularly by Germans and Americans, the English photographers hold their own against all competition, and worthily sustain the high reputation of the British school. Colonel H. Stuart Wortley's sea studies are unsurpassed for truthful expression of the tremulous action of water, for accurate delineation of all forms of vegetation on the foreshore for picturesque arrangement of clouds, and for splendour and variety of atmospheric effects. Mr. H. P. Robinson, of Tunbridge Wells, is famous for his skill in composition and his masterly treatment of light and shade. His merits in these, as indeed in many other respects, are displayed to brilliant advantage in one of the best pictures in the gallery, that entitled “When the Day's Work is Done”—a cottage interior, with an old man reading the Bible, while his wife, of equal antiquity, keeps solemnly knitting. A variety of picturesque landscapes, by members of the Royal Engineers' School of Photography; views in Switzerland and elsewhere, executed from dry plates, by Mr. W. Eng'land; Welsh landscapes, by Mr. Robert Crawshaw, of Cyfarthfa Castle; Arctic views, by Mr. J. A. Grant; studies of horses, by Mr. D. Hedges, and of cats by Mr. H. Pointer; portrait studies by Mr. Valentine Blanchard, Mr. Jean Baptiste Frilner, Mr. Taeschlor, Mr. A. Boucher, and Mr. Carlo Belvas; and numerous works in the departments of scenery, genre, and portraiture by Messrs. Beasley, Jun. Bowness, Faulkner and Co., G. Nesbitt, H. B. Pritchard, C. Klary, R. Slingsby, J. Hawke, R. V. Harman, James Howie, Payne Jennings, M. Kisch, and the Autotype and Woodbury Companies may be commended to the special attention of the visitor. Upon the table will be found a very interesting collection of photographs taken during the Arctic Expedition under Sir G. Nares, and lent for exhibition by the Lords of the admiralty.

The Photographic News.

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PRIZES AT THE AMSTERDAM EXHIBITION.

We are favoured with a letter from our old correspondent, Mr. Haakman, in which he points out that there is a misconception in our recent note upon the prizes awarded to photographers at Amsterdam. In the first place, referring to the medals for portraits, he explains that the jury had no difficulty in awarding the two silver medals; their only difficulty was that there was a plethora of excellence, and the jury were induced to award a third silver medal. But this done, there were many contributors who did not come up to the mark which the jury thought deserved a bronze medal, and so the two bronze medals were kept back. Mr. Haakman adds, in reference to our remarks on the probability that if more English photographers had contributed they would probably have taken many of the unawarded medals:—"Whilst I entirely agree that it is a matter of regret that no more English photographers competed, I wish to mention at the same time the jury declared 'that in awarding prizes they went not by the standard of the pictures exhibited, but by the actual status of photography,' which consideration may, perhaps, enhance the value of the prizes."

He adds some interesting remarks in relation to Baron Stillfried, a silver medallist in the exhibition, that he "is not a Dane, but an Austrian nobleman, who for some time was Austrian Plenipotentiary Minister at Yokohama. He left the diplomatic career, and started as photographer. Baron Stillfried told me he had over four hundred clichés, and thirty-eight Japanese continually at work to print them. Some time ago the Vienna Photographic Society awarded him a gold medal for his ethnographic photographs."

PHOTOGRAPHS AND CHARITY.

A NOVEL case, in which the alleged misuse of photography as a spurious aid to the exciting of sympathy, has recently been brought under public attention. Dr. Bernardo, a gentleman whose name has been before the public in connection with refuges or homes for destitute children, had the misfortune, some time ago, to excite the distrust and antagonism, and, some say, the spite and malignity, of a preacher of the gospel of peace and charity, who publicly made various serious charges against him. This is a question in relation to which we are not called upon to make any comment in these pages, except so far as a photographic question arises. In charging Dr. Bernardo with the maladministration of funds obtained by improper means for charitable purposes, the Rev. George Reynolds makes one special charge in an allegation that photography was employed to impose upon the public credulity. The bickering between the philanthropist and

the preacher having become a matter of public scandal, three gentlemen of trustworthy reputation and position were induced to examine into the charges and arbitrate thereon; and, as we have said, one of the specific charges made against Dr. Bernardo was to the effect that he endeavoured to stimulate public charity on behalf of the homes he had established by fictitious representations of the destitution of children before admission, and of amazing improvement afterwards. Children in rags and distress, selling matches, playing at pitch-and-toss, &c., were photographed as "the raw material as we find it." The charge is made that much of the misery depicted is artfully contrived by pictorial effect, and it is alleged, as a crowning iniquity, that the individual children represented were never in such a state of destitution, nor occupied as they are represented in the pictures. In reply it is admitted that such photographs have been taken and issued, and that the individual models had not been so miserable as the pictures suggested; but that in many cases the photographs are representative or typical, intended to represent, not an individual child, but a class of street children which the refuges are rescuing from vice, destitution, and eventual destruction. The arbitrators, men of the highest character, take an unnecessarily strained view of the case, we think, for, whilst acquitting Dr. Bernardo of intentional deception, they condemn the plan he adopted: they say, "This use of artistic fiction to represent actual fact is, in our opinion, not only morally wrong as thus employed, but might, in the absence of a very strict control, grow into a system of deception dangerous to the cause on behalf of which it is practised. Surely this is unnecessarily straining! If, as we understand is the fact, the photographs really represent the class of destitute waifs to which these refuges give homes, it is, we think, very legitimate to make use of them to illustrate the aim and action of the charity. If they suggest the real truth, it is less important that they should consist of actual fact. The truth and beauty of a great picture are in no wise lessened because it represents something very different to the model who formed the actual fact from which it was painted! The use of photography in connection with this juvenile mission amongst neglected and destitute children appears to us, from the circular issued with the photograph, to be not only legitimate, but commendable and beneficent in every way, both in its aims and its carrying out. We do not in a technical journal enter into the general question, but we may remark that it is satisfactory that the arbitrators, whilst expressing disapproval of some details of management, are able, on the whole, to recommend the homes as well worthy of public support, and acquit their founder of the charges which have been made against him, and which seem to have originated in personal jealousy and spite. The chief danger, we may remark *en passant*, of this and similar establishments is, a tendency, in some respects, to pamper the objects of the charity. We learn from one paragraph of the arbitrators' report that the introduction of Australian meat into the Refuge dietary gave cause of complaint to the boys, and its use was therefore discontinued!"

THE PHOTOGRAPHIC EXHIBITION.

SUBJECT PICTURES.

WHILST there is, we think, in the present exhibition evidence of a higher culture and a growing artistic taste amongst photographers, the number of pictorial compositions is smaller than we have seen at many previous exhibitions. With the exception of Mr. Robinson's grand picture there are few, if any, contributions of a very ambitious character. There are many single figure portrait studies, which are distinguished by fancy names, and many of them possess much pictorial merit; but we can scarcely class them as pictorial compositions.

Returning to Mr. Robinson's picture, of which we have spoken in a former notice, we may remark that in styling it a few lines back as "grand," we use the word advisedly and in a comprehensive sense. Not simply in relation to dimensions, although it is a large picture, but there is a grandeur of style and conception, and in the whole feeling which pervades the composition. The title "When the day's work is done" seems to receive a double illustration. Obviously, from the light and shade in the picture, and the occupation of the inmates of the cottage, it is the close of day, and its toil is over. But there is, moreover, a further suggestion: with the aged man and his life's partner the noon of life is past, and evening is setting in; the day's work of life is nearly done, and the time of rest is at hand. There is another point noteworthy in the photograph. It is a picture of humble life without prettiness or embellishment, but without a trace of anything vulgar. Photography has no imagination, and represents everything placed before it in its simple nakedness as a fact. Hence, there has been amongst many photographers, in dealing with *genre*, a tendency to employ pretty or fascinating models to secure the grace which should give attractiveness to a picture. And we have seen not unfrequently a maid-servant, or a peasant girl, or even a beggar, in a photographic *genre* study presented by a lady who has put on a few rough garments which have failed to cover the perfectly-fitting boots on small, neat feet, or the lace on some portion of underclothing. Art will glorify a cowherd or a barn; but photography will, as a rule, display the naked truth. There is sufficient art displayed here to give all pictorial value to the cottage interior without making it other than a cottage interior. It is that and nothing more, but there is nothing squalid, sordid, or vulgar. It is one of the cottage homes of England which have been sung so sweetly in an unforgotten lyric. And the fine old peasant, sturdy and English in build and aspect, together with his wife, are, as they should be, the noblest part of the picture, in position, expression, and general effect, as well as in technical quality, texture, modelling, and solidity. An interesting feature of this picture is the singularly luminous and transparent quality of the shadows in the darkest part of the cottage interior. One of the curious charges which painters at one time brought against photography was, that that it was incapable of rendering reflected lights, and, therefore, could never give the due effect of space and distance, nor produce anything like true and artistic *chiaroscuro*. The early photographs which were common, resembling often silhouettes in black sticking plaster on a white ground—"soot and whitewash," as they were often phrased—gave some ground for such a supposition. We remember that it was the delight of Mr. Rejlander to secure, in an especial degree, some effect of reflected light. His photograph from life, after the Madonna *Sassoferrato*, in which the tender half-tones of the face, shrouded by a hood, were especially well rendered, was a source of great pride, and we remember the glee and satisfaction with which he first showed us and asked us to accept a copy of the print. An interior like that in "When the day's work is done" would be a sad failure without the perfect rendering of reflected lights. The common verdict of the common public who examine the picture with great care and interest is to the effect that it is a very fine copy of a fine picture; that is, of a painting. All photographers who see it must be glad to welcome Mr. Robinson back as a contributor to the Exhibition, and rejoice that he so dignifies their common art.

Mr. Slingsby's composition entitled "Alone," only just escapes perfection: a charming model in exquisitely artistically arranged drapery skilfully photographed; a most exquisite background, in which the rippling sea and delicate hazy atmosphere are perfectly rendered, but with the one drawback, so easily encountered in combination work, that the lady does not appear to be seated by the shore, or rather that she has no support for her attempt to

sit, and seems to be gradually sliding down. Despite the letter of a correspondent in the present number, who complains that the critics of the Exhibition are too much disposed to praise, we cannot praise what disappoints us; but we admit it with regret, as the picture is so good in most details that it only just fails of being perfect. Mr. Ford Smith, of Llandudno, sends a couple of fine compositions: "Bird-nesting" (246), and "A Bird's Song" (131), both possessing many good qualities. "Bird-nesting" is the occupation of some nice girls in a pretty bit of moorland country; and the subject and scenery are well rendered, and present some admirable technical work. "A Bird's Song" is illustrated by a group in which children and mamma are prodeed, the latter reclining on the ground, and pointing in the direction from which the song-bird is presumed to be heard. The listening aspect and the realization of the bird and song not present to the inspector of the photograph are well rendered. Mr. J. M. Young, of Llandudno, sends some compositions, of which "A Quiet Cup of Tea" is especially good. In Mr. Fry's attempts at composition, "The Taxidermist," as we before mentioned, has some good qualities: his "Fisherman" is a good example of the difficulties in composition not overcome. The landscape background and other accessories are all as prominent and vigorously made out as the fisherman himself. There is, in short, no subordination.

Mrs. S. G. Payne's flower groups are charming examples of floral composition: choice flowers most charmingly grouped, and photographed with rare skill, so as to suggest in many cases the actual colour, as well to render perfectly the texture and character of the blooms. These, and Mr. S. G. Payne's groups of game, are dangerously tempting, as the in "Second of October," "The River Poachers' Basket," "The Farmer's Present," and similar presentations, most vividly rendered, of good things for the table! Mr. Warwick Brooks sends a number of clever bits of *genre*, as "A Word for Dickey," "A Quiet Chat," "Good Morning," "Feeding Time," and others which are very excellent in every way. "I'm going milking, sir" (448), is a charming little subject by E. J. Ayres. Mr. H. Garrett Cocking sends some good examples of *genre*. "After Dinner" (451) is an excellent study of the so-called "working man" under certain conditions. "Cross Purposes" (472) is also excellent. There are other studies containing good work, which do not, however, call for especial notice.

NOTES IN DUBLIN.

BY OUR OWN CORRESPONDENT.

THE delightful landscape pictures of Payne Jennings, at the Pall Mall Exhibition, induced me to believe that I should see something well worth looking at in Dublin in the way of photography. It was my first visit to the Green Isle, and that was perhaps a further reason for my being in a sanguine mood.

But without further preface, I must say that I was woefully disappointed. Not with Dublin itself. The Irish capital may not be everything that is desirable, but it can stand by itself, and has characteristics sufficient to impart a genuineness and "hall mark" to the city. It is no second-class London or inferior kind of Paris. It is a town *en generis*, whose inhabitants seem the happiest and most out-spoken in the world. The mere fact that they have, or think they have, a capital grievance in the matter of Home Rule is of itself something, and when one is permitted to discuss the matter openly in all its bearings well after midnight over Red Bank oysters and whiskey punch, without let or hindrance, poor Londoners like myself think of the strict regulations at home, where neither bite nor sup is to be had after twelve, while many refreshment houses rathelously close their doors at the hour of eleven. Let any hungry theatre-goer in London attempt to obtain supper

at the "Albion" or any other well-known hostelry at midnight, if he wishes to test the difference between the strict laws of our metropolis and those of the easy-going Dublin citizens; even passengers by the night trains at Charing Cross, who are all bona-fide travellers, can get nothing after ten minutes to twelve at Charing Cross Station, and must perforce travel down the line ten or a dozen miles to their homes before they can get their supper.

Yes, Dublin is a comfortable and jolly place enough in many respects, but I cannot say much of the art of photography in the town. There are several good studios—Robinson, Chancellor, Mansfield, &c.—and there would seem plenty of customers, for Dublin is a gay, busy town, and it takes a longer a good half-hour to stroll from the top of Grafton Street, at Stephen's Green, down to the Post Office and the further end of Backville Street. This is the main artery of Dublin, and leads one past Trinity College, the Bank, Dame Street (the Cheapside of Dublin), and other points of interest. Here, too, are to be found most of the studios; but, when found, they display little of interest to a London photographer. There is good work to be seen, it is true, but nothing really worthy of note.

Silver printing alone seems practised; and in one case only, we believe, is carbon printing being attempted in the Irish capital, at any rate professionally. "Carbon printing is very troublesome." In this remark I could not do otherwise than acquiesce, although I might well have replied that, if such were the case, there were many other things in this world quite as vexing and difficult to overcome. To earn money, for instance, is sometimes troublesome; still, many of us worry on, notwithstanding, in our endeavours to gain filthy lucre.

Evidently, however, our countrymen on the other side of the Irish Channel have no desire as yet to go on with carbon printing, and are quite satisfied with the condition in which they find our art. They are easy-going people, and, probably, are quite content to take matters as they find them.

At Robinson's, in Grafton Street, probably the leading studio in the city, I was shown some very fine enamelled cabinet portraits, glazed in the well-known manner, and pressed up in the form of cameos. They were delicate and brilliant, and possessed all the excellence of good work of this kind, but they were, of course, no novelty. Indeed, if pictures of this kind are desired, we think a waxed and collodionised plate, as usually employed in printing small work by the carbon process, would give results quite as beautiful, while they would be more speedily obtained, and of a permanent character.

Other cabinet pictures we looked at, produced by Chancellor and others, were scarcely so satisfactory. Indeed, as we have said, the Dublin photographers seem a little behind the age. Compared to Brussels, Munich, and capitals of a like calibre, Dublin could not hold its own so far as photography is concerned. There is a lack, too, of pictures of the charming environs of Dublin to be seen, of the fine Wicklow mountains, and Avoca Vale; even pictures of Killarney are scarce. It is good, indeed, that our friends have such a capable landscape artist among them as Payne Jennings, whose pictures of the Dargle and neighbourhood of Wicklow are among the finest photographs this year in the Pall Mall Exhibition. If Dublin only boasted a photographer as capable in the depiction of portraits and studies, she would be fortunate.

As we have said, there is evidently no lack of support to Dublin photographers. The fact alone that Trinity College is in the city must have considerable influence upon trade, while the large garrison, the vice-regal court, the public offices, &c., all tend to make the Irish capital a brilliant and busy centre. Grafton Street and Dame Street in the afternoon and evening are as lively and gay as any London thoroughfare, while the rapid picturesque

care add a feature that is quite unique. The fare anywhere about the town by these conveyances is but sixpence, and Mike drives you with a jaunty, devil-may-care manner which, to say the least, is a novelty. I do not know whether Irishmen have got their one-sided ideas from sitting continually upon these cars, but I throw out the idea for what it is worth. For myself, I never spent a happier week than that passed among Home Rulers, Protectionists, and their rivals, nor do I ever remember hearing heated discussion carried on with less show of temper. But, whether the Irish are a downtrodden nation or not, they ought to make better photographs.

FRENCH CORRESPONDENCE.

PROGRESS IN DRY-PLATE PHOTOGRAPHY—TESTIMONY IN FAVOUR OF THE GELATINO-BROMIDE PROCESS—THE RAPIDITY OF KENNETT'S PELLICLE—SUMMARY OF BOIVIN'S COLLODIO-BROMIDE PROCESS—THE COFFEE-ALBUMEN-PYROGALLIC METHOD OF M. QUIQUERRE.

If the question of dry-plate photography is not speedily solved in the most complete and satisfactory manner, it will not be for want of experimenters: and if French photographers do not soon decide to adopt definitely in practice one of the many processes in existence, it will not be out of ignorance of the advantages which some of these methods present. All ideas seem to be directed just now towards those processes which have been recently published, and which till now have had few disciples; yet, on reading of their simplicity and their results, one can only wonder why they have not before made their mark. I here refer to the different communications which have been addressed to me on this subject, not only by my collaborateur, M. Boivin, but by M. Odagir on gelatino-bromide, and M. Bourgoin on the coffee-gum process. Every week I receive communications such as these, accompanied by specimens bearing out the success of the process.

For instance, I have received from one amateur, M. Durand, a lawyer living at Saint Etienne, a further testimony on behalf of the gelatino-bromide process as perfected by Mr. Kennett. M. Durand forwarded me, for transmission to M. Boivin, with a request for trial, a number of the Kennett pellicles and prepared plates, the one furnishing instantaneous pictures, the other of a sensitiveness equal to that of collodio-bromide plates. With the pellicle M. Durand exposes but three or four seconds in a good light, and with the object well-lighted. If trees with much foliage are to be reproduced, then the pose is limited to thirty seconds.

With his well-known activity, M. Boivin very soon replied to my letter and enclosure. He said: "In my anxiety to see the novelty you sent me, I opened the case and hastily exposed one of the plates which M. Durand forwarded; and it was with the most lively satisfaction that I now report that the result obtained was as perfect in every sense. My cliché, made in a ten-second exposure upon an object with foliage, turned out excellent, and I can readily understand that there is here a process which enjoys many advantages. In a little while," adds my friend, "I shall be able to give you more precise details of my results; but I may remark, that my hasty experiment has impressed me favourably in respect to gelatine emulsion, which seems far more rapid in its character than any emulsion made with collodion. A few seconds suffice with the gelatine emulsion to do that which requires minutes in the case, for instance, of the Chardon emulsion."

M. Boivin, who has tried the last-mentioned process with much care, finds it very good on all points. "I only," says M. Boivin, "have one reproach to make, which is that the exposure is long, and the cost of the emulsion somewhat heavy." He adds that he is unable

with M. Chardon's emulsion to secure plates with an exposure of less than three or six minutes, when with M. Boivin's own method, which I have already described in previous correspondence, the same results were secured in thirty or forty seconds. I may complete the details which I had already given upon the preparation of these plates by saying that their development is brought about by the aid of a solution of gallic acid, made by dissolving three or four grammes of the acid in one thousand grammes of water, to which are added a few drops of acetic acid containing twenty or thirty per cent. of acetate of lead. There are, moreover, added to the solution one or two drops of nitrate of silver solution of three per cent. strength. The bath is agitated thoroughly, and then the plate to be developed is plunged into it. When the details of the image have been well brought out, the plate is withdrawn and immersed once more, after some drops of nitrate of silver have been added. The development of the plate is in this way completed. The cliché is washed, and, if necessary, intensified by any known method.

In this plan of development the acetic acid and acetate of lead that have been added play the double rôle of accelerator and moderator; the dose should be augmented when the cliché offers great contrasts, and in this way a more harmonious result is secured.

In a word, the Boivin process, which has not only extreme sensitiveness, but other material advantages as well, may be summed up in the following operations:—Collodionising the glass plates, which have previously been covered with a preliminary film of albumen; sensitizing; application of chloride of sodium and gallic acid solution; washing; application of preservative; drying, exposure, development, and fixing. It must be obvious that a more simple process could scarcely exist.

On the other hand, again, M. Quiquerez, a practised adept of the coffee-gum process, has written to me respecting the communication of M. Bourgois. M. Quiquerez, in a word, confirms all that this experimenter has said on the subject.

Some days ago, he tells me, he exposed six plates prepared by the coffee-albumen-pyrogallie process two years ago. As I told the readers of the PHOTOGRAPHIC NEWS in 1875, M. Quiquerez's process is an excellent one, and some may remember the description I then gave of it. Coffee added to the albumen gives, my correspondent assures me, an extraordinary solidity to the film, while the further addition of pyrogallie acid facilitates alkaline development considerably.

M. Quiquerez adds, in his letter to me, that in the collodio-bromide process he has followed, with every indication of success, the precise details given by M. Boivin anent the process.

ERNEST LACAN.

AERIAL PHOTOGRAPHY.

MR. WOODBURY writes as follows:—

In your last I notice an article on the above subject, from which I gather that several persons are interesting themselves in this (to my thinking) most important branch of our art. That a practical instrument, capable of taking photographs from a great elevation, would be of inestimable value in warlike as well as peaceful operations I have long felt assured, and, in consequence, have spent some time in solving this problem.

The plan that I believe to be most practical, and which I have secured by letters patent, is as follows:—A small camera, which need not weigh more than six to ten pounds, and which does not require a very large balloon to raise it, is kept in communication with the earth by means of a cord having three insulated wires woven into it. By means of these the operator can give an instantaneous exposure from the earth at any moment, and also bring a fresh sensitive surface in front of the lens when required. A number of pictures at different heights having been obtained, the

balloon and camera can be lowered, and the pictures developed.

In cases of war these pictures could, by means of a magic lantern, be thrown on to a screen, and a rough outline sketched for immediate reference. The parts of the camera are composed of the lens, focussed for the extreme distance, in front of which a circular instantaneous shutter is made to pass by merely making contact from the earth; next, a revolving sheet of sensitive tissue (similar to that described by me some seven or eight years ago, and lately used by M. Warnerke) is made to revolve by clockwork, also set in motion and stopped by the electric current from the earth, thus bringing a fresh surface opposite the lens, when the current is again made to act on the shutter. In place of a revolving tissue, a frame, either four, five, or six-sided, having dry plates attached to each face, may be made to partially revolve every time the clockwork is set in motion. A small rudder or tail is attached to the car of the balloon at the opposite end to where the rope is attached, to prevent its turning round.

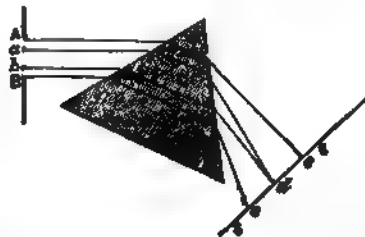
A powerful telescope would enable the operator to choose the steadiest moment for exposing. The whole apparatus can be arranged so that the lens points vertically to the earth, or at any desired angle. As clear, hard, sharp outlines would be more valuable than a fully-exposed picture, there is no fear of lack of exposure.

In case of a strong wind it is possible that the plan (experiments with which have lately been made) with kites might be substituted for balloons.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

In the last number I may have unintentionally conveyed a wrong impression as to the breadth of slit necessary to define an absorption line. I should have added the reservation that more prisms than one should be employed to render my remarks strictly true. This correction I now make, and will endeavour to show why this is. We may show what would happen by the help of a diagram.



For our purpose we may suppose we have a monochromatic light which, when analysed by one prism after passing through a theoretically infinitely narrow slit, gives a single sharply defined line of the breadth of our supposed absorption line; we can suppose that its breadth is the breadth of the slit AB, which we are using with our apparatus when it is in a screen at a fixed distance. Let AB be the slit, purposely exaggerated in width, and let Aa and Bb be openings equal to our theoretically infinitely narrow slit. Manifestly each of these small portions would form a sharp line of monochromatic light, cd and de each equal to the breadth of slit AB; and that also each small portion equal to Aa and Bb intermediate between ab would form lines of a similar width. The result of integrating these images on the screen as would be to form a line of a total width twice what it ought to be, and to make the central portion the brightest, whilst its edges gradually fade off. With a black absorption line

Continued from page 513.

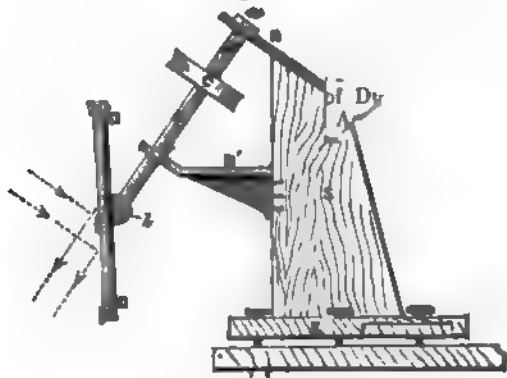
* We have purposely omitted the lenses, as they are only mechanical aids to the analysis of light, and need not be shown when treating the subject theoretically.

we should, of course, get the reverse of this: the centre would be the darkest part, but it would get gradually brighter towards its edges. By passing the same rays through another similar prism no further dispersion of the rays can possibly take place. The breadth of the line must continue the same, and by drawing a figure on the same principle as that above, it will be seen that the centre portion remains bright, whilst the edges fall off much more rapidly in brightness. With three prisms the centre portion (corresponding nearly to the theoretical breadth of the bright line) will be found to be very well defined. With absorption lines the same thing occurs, only reversed as regards light and shade. It therefore will be evident that no line can be here perfectly defined, since it would require the slit to be of the width of a mathematical line; a slit of .004 inches wide with the apparatus described, however, practically gives a very fair result.

During the last week I have been asked, "Why not use a very long focussed lens for the camera, and so get the same length of spectrum as you would by employing three prisms?" The question is a very natural one, but it is easily answered. By having a very long focussed lens you simply magnify the whole spectrum, in length, breadth, and also in the breadth of the absorption lines, and therefore you see no more lines in the larger photograph than you do in the smaller; but by increasing the number of prisms employed, you increase the length of spectrum without increasing the breadth of the absorption lines, and therefore you separate fine lines from one another, which might overlap when the rays are only passed through one prism. There is something also to be said as to the loss of light in the two cases, the advantage lying with the greater dispersive power.

Before proceeding further it may be as well to mention the apparatus to be employed for reflecting sunlight into the collimator. A simple swinging looking-glass may be utilized, but its motion being confined to giving to the mirror a deviation from the vertical plane (unless the whole stand be moved) some form of heliostat is recommended. Spencer, of Dublin, is the only optician that I know of who makes the comparatively cheap heliostat which was devised by Johnstone Stoney. This little instrument costs some £8 or £10. There is another form, however, which can easily be made, the name of the inventor of which I do not know, neither have I seen one of the instruments, though I should fancy that it is of the same kind as is supplied with Monckhoven's solar camera. Being based on the same principle as an equatorial mounting for a telescope, it is easily designed.

I am having one made for myself from a rough model that I contrived with a pencil, some battens, and cardboard, and I will indicate the plan on which it is being constructed:—A is a brass spindle, at the end of which is



a collar *a*, and, at the other it is flattened, and a joint *b* attached as shown. The spindle passes through two pieces of thick sheet brass, *BB*, the latter being bent and supported as shown in the figure; both are attached to a

wooden stand, *B*. The holes through which the spindle passes accurately fit it, leaving it just sufficient play to rotate easily. The collar *a* works on *B*, and supports the principal weight of *A*. To *b* is attached a circular disc of sheet brass, and clamped to it, by means of four screws, is a circular silvered plate of about five-inch diameter, and this is the mirror employed. The rod *A* is set at such an angle that it points to the Pole when set in the meridian. This, of course, necessitates the knowledge of the latitude of the place where it is to be used (if known to half a degree it is sufficiently accurate), and the angle that *A* should make with the vertical should be 90° less the latitude. The lengths of *B* and *B'* are, therefore, dependent on this angle. A pulley and wheel (*c*) is fixed to *A*, and round this and the drum of a small French clock is passed a band, causing the spindle and mirror to rotate. The diameter of the wheel must be so adjusted that it revolves once in twenty-four hours.

When the instrument is placed so that *A* is in the meridian, and points to the Pole, the mirror is adjusted by the joint *b*, till a beam of light is reflected along the continuation of *A*; in other words, the light is reflected in a direction away from the Pole. When once set, if the clock works fairly well, and if the diameter of *c* is accurately calculated, the beam of light will always fall in the same direction, and on the same spot on the ground. Now, by placing a second mirror in the path of this beam, the light may be reflected in any direction required. It will be apparent what a trifling sum such an instrument will cost, and I believe that the whole might be easily constructed in wood—of course, with the exception of the mirror.

The glass used for the mirror should be picked patent plate (if worked glass be considered too expensive), and it is advisable that it should be silvered on the outside. If silvered at the back the rays would be partially polarized, and a loss of light might occur; and also when the light is collected by a condensing lens a quadruple image of the sun, formed by reflections from the front and back surfaces of both mirrors, would be very annoying to work with; at least, such is my experience, even when only two images are formed, as is the case with Stoney's heliostat when the mirror is silvered at the back. I have been trying Martin's method of silvering plates, and, thanks to my assistant, Corporal Davenport, we have been very successful. I propose giving the necessary instructions on this point in a subsequent article.

It may, perhaps, be as well to say a few words on the method of getting the spindle *A* in the meridian. If a piece of sheet brass be bent to form the same angle that the spindle *A* does with the vertical, and if it be screwed into the stand absolutely parallel to the rod, it may be used as the "style" or "gnomon" of a dial. The hours may be marked on the stand by a little calculation, remembering always that if the dial were at right angles to the style the shadow would travel through 15° every hour. The graduation should be taken from one edge of the style for the hours before twelve, noon, and from the other for the hours after twelve, noon. Intervals showing ten minutes may well be marked between each hour. When this dial is prepared, all that remains to do is to note whether the clock time is in advance or behind sun time, and, allowing for the difference, to cause the shadow of the style to point to the time of day in solar time. The rod will then point to the true worth. A compass may be substituted for the dial, if allowance be made for the deviation of the needle.

SUBSTITUTE FOR YELLOW GLASS.

In the *Bulletin*, *Bardy* recommends a plan of preparing glass so that it may be employed for glassing a dark room, in the event of the owner being unable to secure glass sufficiently non-actinic for the purpose. He uses a lac for

the purpose which is simply applied, by means of a brush, either to glass, paper, or cloth, and in this way secures a material which will not transmit actinic rays.

His lac or preparation is made up with the aid of chrysanilin, which may be purchased anywhere, and which is employed in the following proportions:—

Chrysanilin	...	...	3 grammes
Alcohol	...	...	100 "
Water	...	...	50 "

Paper coated with this mixture may be employed for all the purposes of yellow glass, while at the same time it will be found exceedingly useful for wrapping up solutions in bottles, such as emulsions, for instance, which are sensitive to light. The preparation when dry is very non-actinic, and, applied to ordinary glass, furnishes a brownish red film, which is well adapted to the photographer's dark room.

The chrysanilin may also be dissolved in ordinary spirit varnish, which it colours very deeply. To secure as dark a tone as possible, the varnish should be warmed, when a larger amount of chrysanilin will be dissolved, and a saturated solution secured which has a very intense colour. Clichés are much invigorated by the application of this coloured varnish in parts, or uniformly over their surface. In fact, in any case where a non-actinic solution is desirable, chrysanilin furnishes all that is wanted.

M. Bady tells us, moreover, that films or flakes coloured with this substance do not bleach on exposure to the sun.

Correspondence.

COMMENDATORY CRITICISM.

DEAR SIR,—Mr. Montgomery's process to attain an undeserved reputation was, a long time ago, stigmatised by Lord Macaulay in terms which put a stop for a time to the odious system of making a surfeited name by means of exaggerating and puffing. This practice seems to be pursued now to a great extent by some of the gentlemen who review the Photographic Exhibition of Great Britain. I cannot refrain from saying so when I read of the unsurpassed beauty of such-and-such portraits, and the exceptionally wonderful quality of others. Mediocrity may, no doubt, want all that artifice, but don't you agree with me, that real merit suffers from it, and may be in time frightened away in disgust?

It is highly desirable that a Macaulay on a smaller scale should dispose, once for all, of all these Montgomerys of the great photographic art.—Yours truly,

Brighton, October 25th. E. O. DE LA GRAVE.

[We scarcely see the aim of our correspondent. We do not see that the case of "Satan" Montgomery finds any parallel amongst photographers. As a rule, in a fraternity like that of photographers, every man, sooner or later, finds his level, both in fact and in general estimation. It is generally thought now, on a calm review of the facts, that Macaulay was somewhat cruel, or unnecessarily severe, on the harmless vanities of Robert Montgomery. And if his parallel existed in photography, good-humoured laughter, rather than severe "slogging," would probably suffice to suppress the evil. Excess of good nature is, moreover, in criticism, so rare a thing, that it might be tolerated for its novelty. It would be, in any case, better than universal cynicism.—Ed.]

THE MEDALS AT THE PHOTOGRAPHIC EXHIBITION.

DEAR SIR,—In reference to the award of medals at the Photographic Exhibition, will you permit me to say that some little time must necessarily elapse before the jurors can consider all the claims of candidates for the long series of medals announced for competition. Another reason for delay is the circumstance of Mr. Cook's absence in Italy, a

juror whose presence could ill be spared. Mr. Cook's arrival in England is daily expected, and he will probably be in this country before these lines are printed.—Faithfully yours,

H. BADEN PRITCHARD, Hon. Sec.
Royal Arsenal, Woolwich, October 30th.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on Thursday, the 26th ult., at the Free Library, William Brown Street,—the Rev. H. J. PALMER, President, in the chair.

The minutes of the previous meetings were read and passed. Mr. J. T. Danson and Mr. S. Spoonley, Jun., were elected members of the Association.

The President and officers were appointed a sub-committee to attend the meeting of the proposed Associated Science and Art Society Committee.

The council having selected for the presentation print an enlargement of the Arch of Constantine, from a negative taken by Mr. O. R. Green, it was resolved unanimously that the same should be accepted, and a hearty vote of thanks was passed to Mr. Green for his kindness in allowing the use of his enlarged negative. It was announced that the prints could not be printed and ready for distribution until next spring, but a specimen print, in carbon, was exhibited in the room, and elicited universal satisfaction.

A large number of micro-photographs, lent by the Microscopical Society of Liverpool, were exhibited. They had been taken by J. J. Woodward, M.D., U.S.A., and were exceedingly interesting, not only as beautiful specimens of micro-photographic work, but also as showing the necessity of the application of photography to micrometry with reference to the micrometry of blood in criminal cases.

A cordial vote of thanks was passed to the Microscopical Society for giving the members an opportunity of examining such a valuable collection.

The Rev. J. D. RILEY showed a number of excellent prints by a washed pellicle process.

The PRESIDENT exhibited some enlargements by the sciopicon, and some prints taken with the scenograph.

Mr. W. H. WILSON said that since the previous meeting he had been taking some views in Normandy, and found the actinometer invaluable as an aid in judging of the time for exposing dry plates. There he got a tint in the shade in a minute and a half, but here to-day it took two hours in the sun to get the same tint.

Some discussion followed as to the most portable form of actinometer, and it was suggested that at the next meeting the members should bring forward any form of actinometer they thought most suitable.

The meeting was shortly afterwards adjourned until the 29th inst., which would be the annual meeting.

Talk in the Studio.

OBITUARY.—We announce with much regret the death of Mr. Joseph Durham, A.R.A., for many early years of the Photographic Society, a member of its council. Mr. Durham had a high opinion of the value of photography as an aid to the sculptor, and in many cases produced marble portrait busts solely from photographs. As a sculptor he deservedly took very high rank.

RYDE LITERARY SOCIETY.—The opening meeting of a new Literary Society was held in Ryde recently, when, as we learn from a local paper, Mr. James Hughes, the president, delivered an exceedingly practical and eloquent inaugural address to a crowded audience.

A MÆDIEVAL ADAPTATION.—The *Times* thinks that photograph albums very seldom call for an expression of admiration. Their contents may or may not be interesting, but the portraits very rarely are commended by their framework. It feels therefore the more bound to notice a striking exception to this rule in the "Album du Moyen Age," just published. This very pleasant volume—not the less pleasant that it is necessarily for the present without its furniture of cartes-de-visite—is a

bell sh. with 24 aqua illustrations of the amusements and pursuits—including therein certain tribulations—of the Thirteenth and Fourteenth Centuries, selected by Mr. W. Downes, from M.S. in the British Museum (Queen Mary's Psalter and the Beithfield Missal), the Bodleian Library (a MS. of A.D. 1344), and the National Library of Paris, whose "San Graal," "Tristan," "Meliadus," and "Lancelot," have been utilized for the purpose. The illustrations, of which many are humorous, but a large graceful as well as ingenious, are so generally excellent that it is almost invidious to single out any for praise; but, perhaps, we may instance, as among those which especially pleased our own fancy, "La Salutation," from a MS. of Froissart; "Travellers by Sea," threatened by a very ferocious Middle Age Sea Serpent; a capital scene of a weary wayfarer being plundered by monkeys; and "The Warren." All of these are so arranged as to form the setting of cartes-de-visite of various sizes and shapes. In the allotment of the cartes to their appropriate pages, with due regard to the designs in which they will find themselves framed, there is scope for much discrimination and judgment. Many of the illustrations, it is true—such, for instance, as "Travelling," "Music," "Writing," or "Courtship"—suggest their occupants. But what fortunate possessors of the album will have the courage or the modesty to make themselves or their friends the central figures in "The Reprimand," or, still worse, "A Certain Lecture!"

IMPROVED CARMINE INK FOR DRAUGHTSMEN.—The solubility of carmine lake in caustic aqua ammonia is attended with this disadvantage: that in consequence of the alkaline properties of ammonia, the cochineal pigment will in time form a basic compound, which, in contact with a steel pen, no longer produces the intense red, but rather a blackish colour. To avoid this evil, the *Polytech. Notizblatt* recommends to prepare the ink as follows: Triturate one gramme of pure carmine with fifteen grammes of acetate of ammonia solution, and an equal quantity of distilled water, in a porcelain mortar, and allow the whole to stand for some time. In this way a portion of the alumina which is combined with the carmine dye is taken up by the acetic acid of the ammonia salt, and separates as precipitate, while the pure pigment of the cochineal remains dissolved in the half saturated ammonia. It is now filtered, and a few drops of pure white sugar syrup added to thicken it. In this way an excellent red drawing ink is obtained, which holds its colour a long time. A solution of gum-arabic cannot be employed to thicken this ink, as it still contains some acetic acid, which would coagulate the bassorine which is one of the natural constituents of gum-arabic.

To Correspondents.

AN ENQUIRER.—There is no special agency, that we know of, for the transfer of photographic businesses. The best mode, so far as we know, is through our advertisement columns.

Z. DODSON. The best and most efficient mode of enlarging consists in producing a good transparency from the original negative, and from the transparency an enlarged negative. Of course a good transparency is imperative, and we prefer it produced by contact printing either on carbon tissue, or collodion-chloride of silver or a dry plate. Warnerke's sensitive tissue would, we have no doubt, answer well. Indeed, there are good examples of enlargements by its aid in the present exhibition. Carbon tissue for the transparency is said by many to answer best. Thanks for the account of your mode of making dippers.

LMO.—The quantity of silver required by a sheet of paper depends entirely upon the strength of the salting solution, and on the consequent proportion of chloride which the paper contains. Each grain of chloride of sodium requires, in round numbers, three grains of nitrate of silver to combine with it. In practice, with lightly salted papers, like the majority in commerce, about an ounce of nitrate of silver is allowed to a quire of paper. 2. Excess of iodide of potassium will not produce an increase of sensitiveness. About a couple of grains to a pint of silver bath. 3. The addition of citric acid to the printing bath will make the paper keep without change for a few days; but it will decrease the sensitiveness. The best mode of keeping paper is to place it between sheets of clean blotting-paper which have been immersed in a solution of carbonate of soda.

B. R. G.—Printing on rough drawing paper is very effective for large heads. You must prepare the paper throughout yourself. Take Whatman's drawing paper, and salt it by applying a six-grain solution of chloride of ammonium to each ounce, to which about one drachm of well-beaten albumen has been added. Apply this with a sponge or Blanchard's brush. When dry apply in like manner, rubbing very lightly, a forty-grain solution of nitrate of silver. Print and tone as usual.

CHEMISTS.—Lime water is made by immersing quick lime in water. Take a piece about the size of an egg, and immerse in a quart of water, and after shaking well and allowing it to stand a few hours, pour carefully off. The water will only dissolve a very limited quantity of lime. You need not fear to get too much.

A. CLARK.—Mr. Robinson's book is the best work on the artistic side of photography. Burnet's work on Light and Shade is very good, but it has been out of print for some time, we believe. There was an American photographic reprint of it some time ago, which our publishers can, we believe, supply. Your suggestions on lighting and getting rid of freckles are very good.

QUTZ.—Very few operators in this country prepare their own collodion, and whilst good collodion can be purchased ready for use, at very reasonable rates, we see no advantage in the photographer preparing his own. The task is by no means a difficult one; but much experience is necessary in ensuring an article of unvarying quality. We cannot undertake to advise which is best. Popularity is a general and fair test of excellence, and when two or three special makes are universally employed, you cannot do wrong to follow the crowd.

OLD SUBSCRIBER.—Thanks: we do not, however, wish to notice the matter further. The value of censure or praise depends entirely upon the source. When a disputant lost his temper with Dr. Johnson, and exclaimed, "You're no gentleman, sir!" the Doctor quietly responded, "You are no judge!" "Free Lance" is a term usually applied to designate a soldier of fortune who fights for pay rather than conviction. But a *nom de plume* signifies nothing but the aim and taste of a writer. Your remarks would scarcely apply, therefore. We see the meaning of your allusions to a "Freelance" and a "Freemason," but the majority of readers would not do so.

J. J.—The medals of the Photographic Society will be announced and distributed, we believe, at the first meeting in the season, to be held on the second Tuesday evening in November.

C. R. P. VERNON.—In our next.

C. E. G. WYRALL.—Received. Many thanks.

A. J. JARMAN. Thanks. In our next. Your communication arrived too late for the present number.

Several Correspondents in our next.

METEOROLOGICAL REPORT FOR SEPTEMBER.

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.
Observations taken at Braystones, near Whitehaven,
36 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN THE SHADE.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1. 29.73	29.76	29.72	51°	58°	59°		Rain and hail, with thunder and lightning this afternoon and evening.
2. 29.64	29.62	29.57	46	57	51		Rain showers this morning
3. 29.54	29.68	29.80	44	47	44		Rain at night
4. 29.85	29.97	30.00	48	50	50		Fair, generally sunny
5. 29.80	29.86	29.88	44	56	50		Fair, generally gloomy
6. 29.65	29.64	29.57	50	60	54		Rain this morning and evening
7. 29.58	29.63	29.70	60	68	46		Fair, generally gloomy
8. 29.73	29.80	29.81	48	55	50		Fair and sunny
9. 29.60	29.76	29.75	59	57	51		A little rain p.m.
10. 29.76	29.74	29.70	46	58	57		Fair, generally gloomy
11. 29.62	29.41	29.81	57	60	56		Rain a.m. and p.m.
12. 29.84	29.37	29.43	54	57	53		Rain morning and afternoon
13. 29.56	29.57	29.46	50	54	51		Rain all day
14. 29.45	29.60	29.66	56	60	56		Rain a.m. and p.m.
15. 29.50	29.72	29.81	53	59	54		Rain this morning
16. 30.13	30.30	30.18	46	57	48		Fair and sunny
17. 30.20	30.26	30.32	43	64	66		Fair and sunny
18. 30.26	30.20	30.10	49	60	53		Fair and sunny
19. 29.92	—	29.83	37	—	57		Fair, but cloudy
20. 29.76	29.72	29.72	62	55	56.5		Fair, generally sunny
21. 29.75	29.78	29.80	45	54	43.5		Fair and sunny
22. 29.88	—	29.79	48	—	53		Rain at night
23. 29.76	29.62	29.85	63	62	51.5		Fair and sunny
24. 29.92	29.93	30.02	47	—	44		Fair and sunny
25. 30.00	29.98	29.99	52	55.5	51		Showers at noon. Gloomy all day
26. 30.11	30.15	30.19	46.5	58	50		Fair and sunny
27. 30.21	30.22	30.20	54	57	46		Fair, but gloomy
28. 30.17	30.30	29.98	54.5	61	53		Fair, but gloomy
29. 29.87	29.93	29.90	52	58	50		Fair and sunny
30. 29.89	29.86	29.87	47	58	54		Fair, but gloomy
Summary.							
Highest temperature observed	...	...	...	...	58°	...	58°
Lowest ditto	...	...	...	...	43	...	43.5
Mean ditto	...	...	...	...	49.7	...	57.1
Mean of all observations	...	...	...	...	52°-6	...	...
Number of fair days	...	...	...	...	...	...	10
Number of days on which rain fell	...	...	...	...	...	...	12
Number of fair days bright	...	...	...	...	...	...	11
Number of fair days gloomy	...	...	...	...	...	...	7

The Photographic News, November 9, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO. CARBONATE OF AMMONIA IN ALKALINE DEVELOPMENT—PHOTOGRAPHY IN THE NAVY—DARK PRINTING.

Carbonate of Ammonia in Alkaline Development.—Alkaline development has grown into such importance of late that it has become a necessity among photographers to study its various phases. The mainspring of alkaline development is ammonia; and we make free to observe that it is in regard to this compound—the most important of all—that most mistakes are made. Carbonate of ammonia is the salt that is usually recommended for employment in developing dry plates, and yet it is very rare indeed that it is to be found in the photographer's laboratory. Nay, we will go further, and say that, in most of the working chemical laboratories, the compound is absent, and, in its stead, is one which does not contain half the amount of ammonia it should do. Mr. Warnerke told us the other day that more failures in the development of his tissue were due to this than any other cause. An emulsion film is found to be insensitive on development, and is condemned straightway; yet, in nine cases out of ten, the reason for slowness in development is due to the salts of ammonia employed being inadequate for the purpose. It was carbonate of ammonia, probably, when the purchaser first brought it home; but if the stopper is not sealed, and the vessel that contains it not hermetically closed, then, in a very little while, the best carbonate in the world will pass into bicarbonate, and the action of bicarbonate of ammonia as a developer is almost *nil*. It must be remembered. No matter how much you use of the latter salt, you can never get so bright an image as when employing fresh carbonate. A picture will be worked up after a time, possibly, with bicarbonate, but, after all one's care and labour, the result will hardly be worth having. Let our readers, then, beware. If they desire to have recourse to alkaline development, they must first see that they obtain genuine carbonate of ammonia, which should, by the way, not be white, opaque, and powdery, but crystalline and transparent—somewhat like ordinary soda crystals. When obtained, the crystals should be kept in bottles, tightly closed with cork or rubber stoppers, for a glass stopper will not prevent the exhalation of ammonia. If precautions such as these are not taken, then the ammonia gradually goes off, and the compound becomes bicarbonate, or even tricarbonatate, when it is as good as useless for development. Let any photographer make trial of the matter. Let him expose a film in the camera, cut it in two, and treat one-half with carbonate and the other with bicarbonate. The result will convince him in a moment; in fact, here is a case in which the chemist and photographer will scarcely agree. The chemist, in his work, cares, as a rule, very little whether he employs carbonate or bicarbonate; with the photographer, as we have seen, it makes all the difference. Then why not employ liquor ammonia, a chemist may say, and avoid any difficulty? But liquor ammonia, again, has its drawbacks, and one of them is its tendency to dissolve the delicate silver image, so that the photographer has really no help for it, and must perforce get the strongest carbonate he can. He has, however, a very easy plan before him of testing the salt for ammonia, namely, by means of a standard acid solution. Let him prepare the latter, say, with sulphuric acid, and employ this for neutralising the ammonia. When he has secured a good sample of carbonate of ammonia which answers his purpose, he dissolves a certain definite quantity in water, and then sees how much of the standard acid solution is required to neutralise the alkaline solution. Supposing he has dissolved ten grammes of carbonate, he may then find that twenty cubic centimetres of acid solution are required before red litmus paper is no longer acted on. With this result in his note-book he will always reject a sample of

carbonate of ammonia ten grammes of which does not require some twenty cub. cents. of his standard acid solution to neutralise. We recommend this matter to the very serious attention of photographers—and especially amateurs—who are given to practising alkaline development just now, and who may not lay particular stress upon the nature of the chemicals they purchase. We have given them a very easy method for testing their carbonate, and it will be their own fault in future if they neglect proper precautions.

Photography in the Navy.—Photography has long formed one of the subjects of military instruction in this country, and not only are officers and non-commissioned officers instructed in the art at Chatham, at the School of Engineering, but it is one of the subjects, also, for which marks are given at the Staff College, Sandhurst. But no steps have been taken hitherto to introduce a knowledge of the art-science among our sailors, and it is with much pleasure that we learn that at the Royal Naval College at Greenwich arrangements are now being made to form classes for practical photography. Many of our naval officers are already amateurs, and the name of Captain Turton, R.N., and others, may at once occur to the reader; but they have hitherto practised the art on board at their own expense, and without the least encouragement from Government. Captain His Royal Highness the Duke of Edinburgh proved himself an adept at photography when in command of the *Galatea*, and secured some very creditable pictures at the Cape of Good Hope and elsewhere, it may be remembered; but in all these instances the work had nothing to do with official duties. Now, however, it is contemplated to make a certain number of naval officers conversant with camera work; and it must be admitted that better opportunities than those enjoyed by our sailors could hardly be imagined where the camera could be well and valuably applied. Our possessions are so many, and so widely scattered, that, apart from ordinary interest and curiosity, photographs taken at various stations must have considerable intrinsic value both to the Colonial Office and to the mother country generally. The various defences that exist at out-stations would alone form subjects for the camera which would have professional interest at the War Office and Admiralty. In the case of old fortifications, a camera picture, judiciously taken, would demonstrate at a glance the state of dilapidation into which they may have fallen, while if new batteries were in course of erection, photographs would at once show how far the work had progressed. Again, in the case of new possessions—as, for instance, the Fiji Islands—how valuable it would be if our ships lying off possessed a capable photographer on board, ready to secure illustrations for his commanding officer's report! The pictures could be so rapidly taken, and would cost so little, that it is really a wonder photographic apparatus should not long ago have formed an item of naval equipment. As we have said, at last it seems likely that at Greenwich photography will become one of the regular items of education imparted to officers at that institution.

Dark Printing.—Do photographers print more deeply than formerly? We think so. Whether it is the Adam-Salomon school, or the tendency to copy Rembrandt's style, we know not, but a glance round the Exhibition at Pall Mall impresses one with the fact very vividly. Visitors who have been used to seeing the room full of water-colour paintings at once remark upon the darkness of the photographs on entering, and the circumstance that little is to be seen of the pictures after three o'clock in the afternoon this weather confirms the notion. The Pall Mall Gallery is certainly one of the best lighted in the metropolis, and yet, even at noon, there is none too much light to examine the photographs exhibited. Will not somebody attempt a lighter style, and prevent us all alike from becoming Rembrandtesque? It would be a relief to see some genuine photographs of lighter aspect.

A SHORT TRIP TO THE LOWLANDS, LANARK-SHIRE.

BY C. P. R. VERNON.

ON Monday, the 9th of April, I started for my usual photographic trip to the Lowlands of Scotland, making, for one month, Hamilton my head-quarters. Arriving there about nine p.m., I went straight to the "Commercial" Hotel, where its host, Mr. Spalding (who is always so willing to oblige, as can be well testified by the Edinburgh Society) met me at the door of this spacious hotel, and made me feel quite at home.

But this is going very far from the mark, as my letter to the NEWS is not to be about hotels, but about photography. I therefore will now say what apparatus, &c., I took for my trip. First and foremost, two lenses, a rapid and wide-angle rectilinear, by Dallmeyer; a twelve by ten swing-back camera; a Rouch's dark tent; three pints of Mawson's and Huggon's collodion mixed; ten pints of nitrate bath, prepared as Mr. Edwards recommends, viz., a forty-grain bath, iodized by—

Iodide of calcium	...	...	20 grains
Water	...	...	5 ounces
Iodine tincture	...	...	9 drops

this I find an excellent bath, which suits my purpose for views, &c., very well—I also find it reduces exposure, which is certainly another great point; a box of Kennett's gelatine dry plates, which are excellent (I enclose you a print of one of them); developer and re-developer same as given by me in last YEAR-BOOK; some varnish; and some negative boxes, with ready clean glass in—the whole packing into a box on purpose. So by this I am set free of a lot of small packages.

But now as to the work. For the next few days I did nothing but loiter about, looking for views, &c., of which the place abounds. But after this I went to Bothwell, a place which will "Bother-you-well" if you do not mind. But by just saying a few words as regards this place, I may make it easier for the anxious tourist photographer. Just before arriving at Bothwell you will come to a bridge which is well worth photographing, as the river below and fine trees make a superb picture. A little further along is the famous Bothwell Castle, a place most interesting and pleasing for photographers, historians, &c. Now if you cross this bridge (I forgot to say the Castle stands by the waterside), you will see two roads, one leading into Bothwell (where, for the thirsty soul, I may as well say there is an excellent hotel; the name has slipped my memory), which make a very pretty picture indeed. But we won't go there yet, as we are not *thirsty*, so we will take the lower road, and go along about one mile, until we come to an old Roman bridge, beautifully enclosed by trees, and a fine stream of water running in its midst—quite a perfect place, and where the enthusiastic photographer might spend a whole day choosing little bits of scenery, which would be much better than taking large houses which have no interest to the public (except celebrated houses) at all, while a fine view is always acceptable to them. This bridge can be taken on either side, but I took the left side, on entering, in preference to the other, for the following reason: the right side is no doubt beautiful enough for any purpose, but it has the disadvantage of a slight bend, and so much foliage that it is almost impossible to get the whole of this remarkable bridge in. Now this is a point which must be studied here, as the bridge, as before said, is Roman, and there is, of course, some very interesting formation in it (I mean in the masonry). So, of course, you should get as much of it as possible. Now on the left side you get this, and

are long enough to get one or two o'clock, so go at three or four o'clock, if possible, as you will then escape these

Feel.

slightly thirsty, we will retrace our steps to

the Bothwell Hotel, where we can get anything we require, and that little (I say little) good. Now, this being done, we will take a look at the outside of the hotel, &c., to find a suitable place for the camera. The best place is by the railway station, but it has the disadvantage that when a train comes in you are beset with tourists. I was in this lively position, camera, &c., all ready, when a roar was heard, and in came the steam pot. I advise any photographer in this position to make good his retreat—it is no use waiting. I have noticed it as a curious thing that when you are photographing they come and first look at the camera—no doubt very pretty. One fellow I heard say, "I say, Bill, 'ere's a game—come and be photographed!" and, on saying this, he placed himself bang in front of the hotel, legs straddled out, arms forced into his sides, hat on one side, and a clay in his mouth—no doubt lovely in his own imagination, but not in mine. I felt in my mind how nice it would be if it were as it was many years ago:—

"Let the steam-pot hiss till it's hot;
Give me the speed of the Tantivy trot.
Here's to McAdam, the Mc of all Mc's,
Who made us such roads we ne'er tire on!
Here's to the granite of which he so cracks,
And d—n him who rides upon iron!"

The trains only come in every hour or so, so you must pick your own time for photographing, and this little hotel will be well worth while photographing.

The town of Hamilton is in itself not very picturesque; but, of course, there is the Palace, the property of the Duke of Hamilton, which, however, is not very picturesque; but there are some lovely pictures, interiors, avenues, &c., inside the grounds, leave to take which can be obtained on application to the bailiff. The original picture of "Daniel in the Lions' Den" is there. The photographer might have a shy at this; also the "Mausoleum," which, although not picturesque, is antique, and worthy of a picture for solely interest's sake, as it is said to have cost several thousands of pounds building alone.

Now we will turn our steps in the other direction, and take the road to Lanark, on which several places of interest will present themselves to the artist. About three miles from Hamilton you come to a curious old toll bar, and a fine bridge over the Clyde, with some lovely scenery on each side; also, a little further down, you come to the ruined castle Tiblituden (I can't speak of this, as I could not reach it). There is a rail from Hamilton there, and it is well worth photographing.

There are really so many places of interest about Hamilton that it would be only taking up useless space by writing about them all. I will just mention a few more worthy of interest. First, we will take on the railway to Glasgow. There is a very pretty railway bridge at a place called Blantyre, four miles from Hamilton, which is well worth a picture, as it is very finely constructed, and some very pretty trees, &c., on either side. This is also very easy to reach.

Now we will go about sixteen miles from Hamilton, to a place famed for Lowland scenery, viz., Lanark, which, although the capital, is not nearly so large as Hamilton; but, for scenery, it is not equalled round about. There are some lovely falls there (of the Clyde). I will mention only one, viz., Stonebyres, the prettiest one, I think—a fall where the waters flow over immense stones, and, on either side, splendid trees and overhanging stones, which makes a truly delightful photograph. I used one of Kennett's plates, and gave about the same time as a wet plate with Dallmeyer's rapid rectilinear lens.

I will only mention one more place now, and that is the Fairy Glen. About the distance I am not certain; but I will give the description of the place, and if the photographer who reads this wishes to go, he will easily obtain information at Hamilton. I myself went to Glasgow (ten miles) at first, and it is a slight distance on, and belongs to Mr. Hanbury Lennox. It is a glen in which in

front of you is a cascade of water flowing over rugged stones and amongst lovely ferns and wild flowers, trees, and, in fact, a regular wilderness. The place itself is a trifle dark, and requires a lengthened exposure; but when you get a photograph it quite repays you, as it has a sort of fairy look about it, and a silvery light on everything which makes it so true to its name the Fairy Glen. There are lots more places of interest here for photographing; but I cannot write any more, as I have written too much already. But I am sure it would repay any one to make a visit to this beautiful part of the country, when he would return with good negatives which would be useful in any respect.

The expenses are very slight indeed. But there is one thing I must advise the smoker—that he can't get good tobacco there (at Hamilton). It has been said that the Scotch are a reserved nation, but my short experience of them made me think otherwise. They were always ready to help, both in advice as to the best ways of reaching places, and the best inns, and I always found them most ready in conversation.

Another thing I must say. Don't go out far on a Sunday. I will here give an incident that happened to me. I wished to see a place I intended visiting (about fourteen miles away), so I went on a Sunday in a trap. When I got there I wished to give the horse some corn and a little water, and also to refresh myself. But the stern landlord would not give us anything. I pleaded I was a traveller, but it was of no avail, so I had to return again with nil.

And now I hope this short article will be of some use to the traveller, as I often think how useful it would be if the photographer just jotted down and sent for publication his notes on his summer outing. Time and money might be saved by it. What I have written is simply from memory, so if any of the distances are wrong I hope I may be excused; and if my hints do not interest the reader, let me give him some advice, and that is, Don't read it!

THE PHOTOGRAPHIC EXHIBITION.

From the GRAPHIC.

The Annual Exhibition of this Society, which is now open to the public at 5A, Pall Mall East, illustrates the immense progress which the art of photography has made during the last few years, and is, altogether, with regard to the general high degree of excellence attained, the most satisfactory collection of sun-pictures yet brought together. As there are upwards of five hundred numbers in the catalogue, and as many equally meritorious works were, we understand, shut out for want of space, it is evident that this Exhibition is thoroughly appreciated by the professors of the art, whether amateur or professional, native or foreign. Without further prelude, let us plunge at once into the catalogue, and begin by remarking on the capital work executed by the Royal Engineers' School of Photography, as, for example, in the two large pictures of the great "Beech Tree," and the "Oak, Kewale Park," the former of which is an untouched silver enlargement. Messrs. Stillfried and Anderson, of Yokohama, send some characteristic examples of Japanese architecture, foliage, and people. Mr. Robert Crawshaw, of Cyfarthfa Castle, a veteran amateur, exhibits some specimens of Breconshire scenery, very soft in effect. Mr. William Eagland, whose Swiss photographs are so widely known, is represented here by numerous examples, remarkable for their extreme distinctness of definition. These are from dry plates. Next we have Colonel Stuart Wortley, whose photographs of sea and shore are so highly appreciated. Of course there is a certain amount of device about his "moonlight" effects, since "that orb'd maiden with white fire laden," does not, like her big brother, the sun, do anything in the art way. Photography serves many useful purposes nowadays. For instance, it is a potent aide-de-camp to the scientific lecturer, as witness Mr. Edward Viles's enlargements of microscopic objects, such as a honey-bee's tongue, or a blue-bottle's proboscis. The *Pandora* Arctic Expedition is effectively illustrated by Mr. W. J. A. Grant's photographs. Next comes a frame which will delight mammae—Messrs. R. Paulkner and Co.'s instantaneous portraits of chil-

dren. There are scores of them here, and the expressions are delightfully natural. Next we come to a foreigner, Bernard Michewski, of Carlsruhe, whose portraits are remarkable for their excellence, especially those on a large scale, taken with a Dallmeyer 6A lens, after fifty or sixty seconds' exposure. Mr. A. Boecher, also a foreigner, though domiciled at Brighton, exhibits some capital work in the way of portraiture. Nor must we forget in this connection Mr. Valentine Blanchard, one of the Vice-Presidents of the Society, who exhibits some excellent portraits—one, for example, of Valentine Bromley, the promising young artist who was cut off so prematurely last spring; and another a head of Lear, the model for which was an old Frenchman, well-known to frequenters of the Strand, where he goes about bare-headed, selling oranges or newspapers. Photographs which aim, by a careful arrangement of figures and accessories, at depicting an incident such as a *genre* artist might choose for his pencil, are apt to fail, except on a small scale and with comic subjects; there are exceptions to this rule, however, and at least three examples of this class in the exhibition attain a high degree of success, namely, Mr. H. P. Robinson's old couple resting after the day's work—a thoroughly Faed-like study; Mr. B. Slingsby's "Alone"—a girl seated on a sandhill by the sea; Mr. Samuel Fry's bird-stuffer surrounded with specimens—a subject recalling Mr. H. S. Mark's peculiar humour. Returning to portraits for a moment, we would call attention to those of Tasechier, and also point out Feilner's "Characteristic Heads of an Actor," interesting as showing the sitter's command of facial expression. Mr. Carlos Reives, too, a Portuguese amateur, sends some good work both in portraiture and landscape. We have left out dozens of names equally deserving of mention, but space presses us, so we will, in conclusion, merely advise our readers to visit for themselves this most interesting exhibition, not forgetting finally to look at No. 433, in which frame the Woodbury Company exhibit their process of surface printing from metal plates. The curious thing is that, on pressure being applied, the gelatine, which seems so soft, makes an impression on the pewter plate, which seems so hard, so that the latter can be printed from. The same phenomenon certainly obtains among human beings, for a soft, gentle woman often makes a very decided impression on a man who seems as hard as nails.

[From the TABLET.]

Many years ago, when the Coliseum—that in the Regent's Park, not its namesake at Rome—was an institution, there was a rival, though a humbler, exhibition in its vicinity known as the Panorama. This latter building still survives, though it has long been turned to other purposes than those of amusement. In the days of which we speak the magic lantern was a very poor show indeed, dissolving views were in their infancy, and the oxy-hydrogen light was as yet unknown. At the Panorama, however, rare and, as it then seemed, marvellous effects were shown in sunset and moonlight scenes, but the speculation was unfortunate, and the proprietor, shaking the dust of perditional Albion from his feet, returned to *la belle France*. In after years his name was world-famous, for Daguerre has been universally admitted to share the honour of the invention of photography with our Henry Fox Talbot. True it is that some Dryadists claim the primal idea for Josiah Wedgwood; but the claim is too nebulous, and the proofs are too vague, for serious consideration. The art has grown apace, and Daguerreotype and Talbotype have long been superseded by an infinity of processes, without, however, reaching the goal of colour reproduction. The present Exhibition, nevertheless, fully shows the marvellous development and the progress, both in an artistic and mechanical sense. Taking the first number in the catalogue, not only for its priority, but also intrinsic excellence, we must give the palm to the very superb panoramas of the "Centennial Exhibition Grounds and Buildings," from the atelier of Mr. Gutkunst. The artist has taken his point of view from George's Hill, and with rare skill has reproduced the myriad buildings clustered in Fairmount Park in the past year. Speaking from personal experience the present writer can speak to the fidelity of the view and to the ability with which the difficulties of representing so extensive an area have been so successfully overcome. The focus is everywhere preserved—a result which will be regarded by experts as a marvel when we say that this view is obtained by printing from no less than seven negatives, and that it is impossible anywhere to note the points of junction. Nor has Mr. Gutkunst been less successful in his portraiture, the large head of Professor Longfellow being the most characteristic likeness we have seen of the poet. Picturesque England and Ireland have fared equally well at the hands of Mr. Payne

Jennings, of Dublin, some of his views, notably of the Dargle, Glendalough, and Killarney, being most artistic, the difficulties of the foregrounds being set at naught, and the half-tones being most luminously rendered. Mr. Brownrigg, also of Dublin, a distinguished amateur, also represents the beauty of Irish scenery with much skill. Mr. Gutekunst and Mr. Jennings were awarded diplomas and medals at the Philadelphia Exhibition; we are not quite sure with regard to Mr. Brownrigg, but if he did not obtain these distinctions he certainly has fully merited them. It is impossible in a catalogue of some seven hundred frames to enter into a detailed account of the several exhibits; we therefore shall, with as much brevity as possible, note some of the more remarkable specimens. The Royal Engineers' School of Photography at Chatham contributes some eighteen large landscapes, mainly woodland scenes, all excellent. Mr. Stephen Thompson has a most charming series of foreign views, amongst which, we think, some interiors in the Vatican and the Pope's Private Garden will have much interest for our readers. The Swiss views (dry plate) of Mr. William England are all admirable, and Mr. W. P. Frith, of Reigate, has two exquisite wet collodion plates of "Canterbury Cathedral"—one the exterior of the glorious fanes with the Bell Harry Tower, the other the interior of Trinity Chapel, with the tomb and armour of the Black Prince, and, if our memory serves us, the tombs of Henry IV and his Queen Joanna. Mr. Vernon Heath's very fine "Glen Shire, Inverary," has been reproduced in a carbon enlargement by the Autotype Company, which also contributes a number of remarkable works printed in permanent pigments. Mr. Forhead, of Ventnor, and Mr. Milman Brown, of Shanklin, illustrate well the Isle of Wight; and Mr. F. Beasley, jun., in addition to exquisite views of "Steephill Cove," and the "Keep, Carisbrook Castle, represents the varied and glorious scenery of Devonshire and Cornwall. The beauties of artists-beloved Bottesw-y-Coed are treated by Messrs. Lisdon and Sons and Mr. C. V. Shadbolt, and the charms of Guernsey and Sark are well represented by the camera of Mr. T. R. Hutton, of the first-named island. Dr. van Monckhoven, of Ghent, displays several remarkable enlargements printed in carbon, all distinguished by delicacy of demitone; and Mr. Edward Viles heads the scientific list with microscopic enlargements to the extent of two hundred diameters. From Japan comes quite a gallery of Japanese landscapes, subjects, and objects, technically excellent, but specially interesting as illustrating the costumes and peculiarities of old Nippon, now so rapidly passing away. Messrs. Stillfried and Andersen, it is to be hoped, may still continue their field of researches. But the present exhibition will be notable for the comprehensive series of photographs taken during the last Arctic expedition from the *Alert*, *Discovery*, and *Valorous*, lying in Disco Harbour, to a view of the Palaeocrystic Sea taken in April, 1876. The Lords of the Admiralty have lent no less than 107 plates, arranged in order from the starting-point at Disco, through the gamut of higher latitudes, until the furthest point of exploration is reached, in the camp in Westward-Ho Valley, lat. 82 deg. 35 min. Mr. W. J. A. Grant also contributes a number of Arctic views, subjects, and groups of great interest. Before leaving the field of landscape we must take exception to Colonel Stuart Wortley's *Studies of Waves and Clouds*; we can do this the more frankly as the gallant amateur's reputation is so fully established with the general public that it seems almost heresy to doubt. The moonlight effects are of the lime-light *couleurs*, and the breaking waves without an exception are woolly and blurred. The intention is admirable, but the execution wretched. Truth to say, the camera does not lend itself to composition, and with but one exception the picture subjects are failures. The exception is the "Alone," by Mr. R. Stingsby, of Lincoln, the pose of the figure being graceful and unstrained, and the landscape adjuncts artistically treated. Portraits, it is unnecessary to say, are in a large majority. Mr. Valentine Blanchard shows an excellent likeness of the late Mr. Valentine Bromley, and a study of the venerable "Echo Boy," known to all frequenters of the Strand. Herr Feilner, of, if we mistake not, Hamburg, presents a number of portrait subjects luminous in the lights and graduated in the shadows; and Herr Mischewski, of Dantzic, must also be noted for the pictorial beauty of his studies. In the entire series of portraits there is nothing, in our opinion, that can compare with the instantaneous portraits of children taken by Messrs. B. Faulkner and Co., of Baker Street. Unforced, and natural to a degree, they are the only photographs we have ever seen that have succeeded in arresting the evanescent and ever-changing expression of infancy. In the purely-mechanical processes there are excellent examples

heliotype, produced by lithographic ink from blocks, and surface printing from metal plates in gelatinous ink, undistinguishable from solar printing, the production of the Woodbury Company. Amongst the "curios" we may mention the Autotype reproduction of the "Common Place Book" of John Milton, and some fac-similes of ancient manuscripts. The copies of crayon portrait by Mr. G. Piercy, of Pall Mall East, are undistinguishable from the originals, and the gelatine lantern slides by Mr. W. B. Woodbury, of Lower Norwood, may yet revolutionize an important branch of industry. All who have albums (and who have not?) must have regretted their dilapidation and the deterioration of the cartes; the new revolving album of Mr. G. Hars, of Calthorpe Street, will therefore be welcomed as effective for preservation and ingenious and simple in construction. For all those whose time hangs heavy on their hands, and all who have an hour to spare, no more agreeable pastime can be recommended than that at 5, Pall Mall East.

THE MATHEMATICS OF PIGMENT PRINTING.

BY POCO MAN.*

BUT, as to cost. Let carbon material be placed at the same figures, and the albumen process, I believe, would be speedily and generally abandoned wherever the carbon process can be regularly worked. The last remark would seem to imply that it cannot be regularly worked anywhere. No! It cannot be regularly worked, in its present form, anywhere south of 35° latitude north, and north of 35° latitude south. All above 35° north, in North America, it may be regularly worked, and will fulfil all the demands of daily business, whether large or small, as well as the albumen process. In all that vast region lying between 35° north, and 35° south—70° of latitude—it cannot be regularly worked. In Mexico, Central and South America, with the exception of the lower part, only specially favoured spots, and at favourable intervals—being guided by the hygrometer—can it be worked at all. In the important cities of Rio, Bahia, Pernambuco, Para, &c., their photographers may sigh in vain for carbon. Who, knowing anything practically about the humidity of the climate and temperature of that vast tropical belt, would give as much as two nickels for the "five patents" (eight now, I believe—they grow so fast in number that one can hardly keep up with them) for all the territory comprised between 35° north and 35° south, containing ever so many populous cities and ever so many millions of inhabitants and millions on millions of square miles—who, I ask? Echo—who? High temperature alone is no bar to the successful working of the carbon process; but when this is coupled with great humidity, it puts an immediate quietus on pigment printing. Reticulation, in its most violent form, is then the rule. For several weeks, during the past summer, I was unable to work in carbon from this very cause, further aggravated, too, by almost daily thunderstorms. It is proper here to say, however, that that was upon a collodion substratum. Yet, upon a substratum of chrome aluminé gelatine (transparencies and carbon negatives), I succeeded, with only a sign of reticulation.

It has always seemed unaccountable, seeing how useful the carbon process is in photography, that there should not have been more workers in it. So much has been written to spread a knowledge of it by practical men and experts. Excellent papers have been written upon it by such men as Sawyer, Blair, Johnson, the late Mr. Window, Mr. Foxlee, Van Monckhoven, Mr. George Croughton, Mr. Phipps, and a host of others, that it is really astonishing that there should be so few. In England a great many began in it early, but in the United States they may be counted on your fingers and toes. I now speak of autotype. There are a very few, widely separated, working without any concert or interchange, each one for himself and independently, and yet some of them have shown work equal to anything done by him of the "five patents." The great body of photographers are continually letting good things slip by them, or passing over things "lying around

* Continued from page 330.

loose"—the very things, too, that they so much need; and the next thing they know is that a Lamb-bear has come along, picked them up, and put them together in proper order, and, lo! behold! a new process, to see which you have to put up a "blind" of \$100 gold—no greens—"five patents."

1st. Chromotypes. The only new thing in this is the tinted collodion, and the enamelling process was ready to hand.

2nd. Retouching. The enlarged negative or positive, by means of tracing paper, called *papier minérale*. A process published years before by Mr. George Croughton.

3rd. Contretype. The multiplication of negatives or positives. A process practised for the last ten years by most workers in carbon—nothing new.

4th. Enlarging upon collodion. Known to everybody from Archer down.

5th. Self-registration. A better means is by cardboard *portes*.

All that is named in the above "five patents" is the tinted collodion and the very purple tissue.

There are some "stunners" in the advertisements of the "five patents." *Par exemple*: "Lights and shades changed at will," "Rembrandt pictures obtained from ordinary negatives," "Coloured prints obtained mechanically," &c. Coloured prints worth the having are not to be produced mechanically by any process whatever. I suspect that they are on about a level with the much-vaunted "Photochrome"—cheap and nasty. Rembrandt pictures from ordinary negatives can be made, it is true, but not mechanically.

The chromotypes which embellished *Anthony's Bulletin* for July are the best examples of the process that I have seen, and the enterprise of the Messrs. Anthony and Lœffler deserve the thanks of the entire photographic fraternity of America. When the Lamb-bear processes first came into prominent notice, I took it as granted that they were superior not only to the silver process, but also to that form of carbon printing heretofore known as autotypes, which I took up at the very first, and have made regular use of for some special kinds of work. I was led to this by the extravagant praises I saw of the processes in the photographic journals, together with the published opinions and commendations of gentlemen eminent in the profession—the validity of which I will not presume to question. But for a long time it was difficult to get a sample for inspection. At last, however, one came, and at sight of it my feathers fell. It was not as good as a silver print would have been from the same negative, I could easily see; but the decidedly purple colour of the picture was taking, and over all the blue collodion lent it a rather seductive charm; but the manipulation was bad, and, as a picture, was not as good as a well-made autotype—a process now neglected, but destined to come to the front and to take the lead. I thought, though, that with more practice would come better skill, or the process, in other hands, was capable of better things. And here I made a very large pause. After a considerable lapse I was favoured with an inspection of some made in Europe, which were better. Then came the illustration in the *St. Louis Practical Photographer*, but it showed up Gentili as a getter-up of compositions rather than Lamb-bear's process, and, like all similar productions, interesting only to Gentili and his patrons—the "Apollo Club."

In Mr. Lœffler's picture (profile of a lady with the face shaded by the hand) the modelling of the picture is good, the delicate detail well rendered, and whites pure and brilliant—much more so than is possible in silver printing. In this one respect the carbon process has every advantage over the albumen process, and this quality in the carbon process is just what chiefly caused me to fall in love with it, when Mr. Swan first gave his process to photographers. The reverse of this is the case in silver printing—the high lights become obscured, and all the more delicate detail is completely lost. Compare a print in silver with one in carbon from the same negative, and it will be seen that the

highest point of light is brilliant, pure, and absolute, and in the silver print it is lowered, dirty, and confused. Carbon has, too, a more extended range of gradation.

Having seen from samples the capabilities of the chromotype process, I am now more than ever satisfied with that form of carbon printing known as autotype; and, as I before pointed out, the finished results of the two are identical, saving that the chromotype is of a strong purple colour. There is no other difference, absolutely; a print of one is as fine as the other, and although I have never seen the chromotype process worked, and am, therefore, entirely ignorant of the manipulations, yet, as the results do not differ, I therefore conclude that the manipulations do not differ widely.

Now, as to whether one likes the colour or not of pictures by either process, is simply a matter of habit, of prejudice, of taste, or the want of taste, whichever you please; but this I know, submitted to the public, about as many incline to one as to the other, and, as a basis for colouring, the artist greatly prefers the more neutral colour of the autotype. I believe that the chromotype is a mere novelty, and will give place, as soon as the new has worn off, to the regular, steady-going veteran autotype, of which it is a mere capricious variation, and, like all caprices, especially French ones, will soon die out when it shall have served its chief purpose, viz., to line the pockets of its inventor.

Le Moniteur made a good thing of it in England, and will have made a good thing of it in America also. His head is level, commercially, and he does things in a big way, too. It took two ships to bring him to this American hemisphere. He bragged early that he would clear \$30,000 out of American photographers. Patents on photographic novelties are good things, commercially—big money in them—much better business than making pictures under a dingy skylight up seven flights of stairs, on a not-very opulent street in the Latin quarter of Paris. When Lamb-bear has gotten all the money he can out of his "five patents," he will doubtless retire to a showy life in the gay capital of "La Belle France," and be driven in his own gay carriage upon the *Boulevards des Capuchins*, and the *Bois de Boulogne*. He should have conspicuously painted on it "*La Duperie des Photographistes Americaines*," and for a coat of arms he should have blazoned upon its doors a roll of red contretype tissue and a squeague.

There is one thing in the way at present, but is temporary only, of the spreading of the autotype process in America, and that is this: The first thing that Lamb-bear (and what a bear he is) did after landing from the two ships which brought him over, was to get the stock-dealers, who had hitherto supplied autotype materials, to enter into a compact or contract with him not to supply them any more. What was the consideration, I cannot even guess; but there must have been a *quid pro quo* in the matter; but he most effectually blockaded autotype workers for a while, for they could not get any material in America until they made arrangements to import it themselves. The Messrs. Anthony advertise that they are sole agents of the Autotype Company in North America, "for the sale of tissues made under Swan's patents, and also for the special materials required for Lambert's patented processes," but decline to sell to any but Lambert's licensees.

But this will not last long. The way is already open, so that the old workers can get as large stocks of autotype materials as they may desire, and also all the new ones, who desire to take up the process, will be able to get supplies to any extent. And I would strongly urge every live photographer to give the autotype process of carbon printing a fair trial, for I believe it to lead directly into the process of the future, as I before pointed out. It costs nothing, and will be found very useful and profitable to all. And so far as all needful instruction goes, the older workers will be glad to give practical demonstrations in person, or all needful instruction through the medium of the *St. Louis Practical Photographer*.

The Photographic News.

Vol. XXI. No. 1001.—NOVEMBER 9, 1877.

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A NEW CARBON PROCESS.

We fear that with some of our readers our heading will prove rather startling than pleasing. The prospect of having time and money expended, experience already gained set aside as useless, is not attractive. But successful carbon printers may dismiss their fears, and those who have feared to encounter the anxieties of carbon working as it stands may rejoice. The process to which we refer, although essentially in many respects new, does not altogether abandon old material or old principles; but it essentially improves and simplifies. We have recently received from our friend Mr. J. R. Johnson, whose name is so essentially associated with recent improvements in carbon printing, some exceedingly charming specimens of a new process he has been working, and of which we have now the specification before us.

The first point which strikes us in the pictures is a singularly beautiful quality which distinguishes them. They have the rich depth and transparency of a fine old mezzotint engraving, and are very fine in colour. On a closer examination they appear to be printed on opal glass, having that peculiarly diaphanous effect; but they are, beyond a question, on paper. On referring to the back of the prints we find that they are described as produced by single transfer process, and find in the specification a very simple single transfer process described.

But one of the most important improvements we find to be in the colouring matter used in preparing the tissue, and one which affects the permanency as well as the beauty of the results. All who have taken interest in the carbon process are familiar with the difficulty of securing a warm rosy tint which shall be permanent. Carbon—that is, lamp-black, and its congeners—is permanent, but the tint is cold and dull, and it has been found desirable to add some warm and luminous pigment to give beauty to the prints. Carmine, which effects this admirably, is very fugitive, and soon leaves the print looking poor and cold. Hence some have raised the outcry that carbon prints fade. The permanent tint giving the most effectively warm rosy tint to carbon is alizarine, or madder lake; but this, unfortunately, stains the paper, and is hence impracticable in use. Mr. Johnson has found a method of overcoming this difficulty, and he can use the finest rosy tint possible in the most permanent form without risk or difficulty. The peculiarly diaphanous effect which gives the peculiarly porcelain-like effect to the print consists in an easy and simple method of practically giving an eburneum backing to the print in mounting.

In the specification we find a provision made for securing in a simple and efficient manner a quality in the prints of singular excellence, consisting, in fact, of two layers of pigment in the tissue: the darkest, deepest, and most

forcible forming the deep shadows of the picture, whilst that forming the half tones is altogether more delicate. The provision for securing this is very simple, but we need not enter into detail here.

To render the single transfer process available without loss or inconvenience, Mr. Johnson includes in his specification a very simple and efficient mode of transferring negatives to permit of reversal in printing, into the details of which we need not enter here. Nor need we enter into the various minor improvements which give facility and simplicity to working, as well as add to the final excellence of results. We hope shortly to place the specification before our readers.

THE PHOTOGRAPHIC EXHIBITION.

VARIOUS PICTURES AND APPARATUS.

THE gentlemen charged with the duty of adjudicating the awards at the present exhibition have, we understand, completed their labours, and their decisions will be made known, and the medals probably distributed, at the next meeting of the Society, to be held in the Exhibition Gallery on the evening of Tuesday next.* So far as we have learnt of the awards, they will, we think, give general satisfaction; in any case, it will be difficult to question the fitness of the gentlemen who were good enough to undertake the duty of adjudicating. Possibly, the work of few of the gentlemen numbered in the two score of Royal Academicians is better known or more popular than that of Sir John Gilbert. The extent to which he has drawn illustrations for popular periodicals has familiarized the nation with his work, which is always full of "go," or *chic*, as the French would phrase it, and is especially distinguished by fine composition and light and shade. Sir John, we learn, took the deepest interest in his task, and was more greatly impressed with the capacity of photography, when it was concluded, than he had ever been before. In some cases, we understand, it was found desirable to withhold medals offered, from insufficiently meritorious pictures only entering the special competition.

Before referring to a few pictures which have before escaped attention, in our attempt at classified notices, we will glance at the apparatus—of which there is not much contributed in the present exhibition. We were much interested in a revolving album for stereoscopic slides, and graphoscope, exhibited by Mr. G. Hare; but we, unfortunately, were the victim of an evil difficult to avoid. We had made many attempts to examine the revolving album in question, but always found it monopolized. On the last occasion that we visited the exhibition we resolved not to be deprived of the opportunity, but to watch and wait an opportunity to seize. For upwards of thirty minutes we stood near and watched a young lady steadily revolving and re-revolving the album, and examining the slides with one eye, the other screwed tight up, and occasionally assisted by the hand in maintaining its closure. At length, happily, from sheer weariness, the attention became slack, and the moment of surrender was manifestly at hand. We approached, and were ready; but we reckoned without our host. It had not occurred to us that it might be bespoken beforehand. But a hushed, whispering call of "Charlie!" and a beckoning motion with the fingers, summoned a young gentleman, apparently of the mature age of eleven, who took possession of the album, and commenced by revolving it as rapidly as possible without looking at its contents. After this preliminary, however, he commenced in earnest to go through the whole of the slides. We watched, and returned to the table at intervals during the next forty minutes; but found it had changed hands in favour of another lady, not less assiduous and persistent in her examination, and we gave the matter up as a bad job. An examination of the similar revolving albums for

* Since these remarks were in type, we have received the official report, which we append below.—Ed.

cards and cabinet landscapes showed us something of the principle. It appears to be certainly one of the most ingenious contrivances for exhibiting a number of small pictures in succession we have seen. It consists of an oblong box of neat cabinet work, about the size of a page of the PHOTOGRAPHIC NEWS, glazed at each side, and suspended so as to revolve on a central axis, each revolution serving to displace the picture in front, drop it, and bring another under the eye. The precise mechanism we do not know, but it appears to be analogous to that of Mr. Hare's automatic changing box. Whether these ingenious albums have been distinguished by a medal or not we do not know; but we hope they are, as they well deserve it. Mr. Hare also exhibits portable cameras with good points. Mr. Woodbury exhibits an exceedingly convenient stereoscopic camera. But, as we have said, the exhibits in apparatus are very few.

Amongst pictures which have not entered into the classification made in our notices are some exceedingly fine views of shipping by Mr. W. Durrant, of Torquay. Mr. Durrant is, we believe, an amateur, and his work, from its rare excellence, looks like a labour of love. Yachts of every kind, in almost every condition, from full sail to bare poles, are rendered with great delicacy and perfect definition, apparently in many cases instantaneous pictures. There are generally good skies; and, in many cases, being taken from the seaward side, the shore, shore objects, and town form a pretty background. It is dangerous to vaticinate, but for these we should feel strongly inclined to predict a medal. Amongst American contributions which we failed to notice before is a frame of portraits to illustrate the effects to be produced by Mr. Lafayette W. Seavey's backgrounds, and the effects, as well as the photographs, are certainly very satisfactory. There is not such a superabundance of enlarged pictures in the present exhibition as there has been in those of late years; but there are many very good ones. It becomes almost superfluous to say that the Autotype Company and the Woodbury Company seem to have attained the limits of perfection in this class of work, and both send admirable examples. Perhaps amongst the most interesting of the enlargements sent are the carbon enlargements, by Mr. Annan, of men whose faces it interests us to see. There are Dr. Allen Thompson, a well known name in science; and Sir Daniel McNece, the President of the Royal Scottish Academy (a face expressive of the geniality and humour, as well as ability, for which he is distinguished); and a late president—Sir G. Harvey. These are all admirable as enlargements. Another fine enlargement of a well-known man is sent by Mr. A. Donald in the head of George Gilfillan. Dr. Van Monckhoven's fine enlargements direct on carbon, which we described a few weeks ago, excite well-deserved interest. The Royal Engineers' School of Photography also send capital enlargements.

The studies of animals by D. Hedges and Harry Pointer we have before described as little short of perfection in this line. Mr. J. Vaughan sends some good pictures of a similar character. The portrait of a fine mastiff, "Kepler," late the property of Mr. Huggins, photographed by Mr. J. Stuart, is a noble portrait of a noble animal. Mr. S. G. Payne's studies of prize Aylesbury Ducks, Japanese Silkies, Dark Brahmas, and Light Brahmas, are enough to make every fancier of fowls break the Tenth Commandment, so charmingly are all the points rendered of unusually fine specimens. Some studies by D. Johnston, of Wick, showing much artistic feeling, as well as technical skill, are worthy of notice.

There are many excellent contributions to which we have not had opportunity of special notice which were well worthy of notice, but on which, we fear, opportunity will not be afforded for special remark.

We append the list of medals received just as we go to press.

MEDALS AWARDED.

For two Pictures which in the opinion of the Jury display the greatest general excellence:—

281 "When the Day's Work is Done" H. P. Robinson
241 Tired Companions ... G. Nesbitt

For the best Landscape, 10 × 8 and under, and for the best above 10 × 8:—

117 Wickham Bridge ... Edward Brightman
501 Ullswater ... Payne Jennings

For the best Portrait above 12 × 10:—

276 Hugh Owen, Esq., F.S.A. ... Valentine Blanchard

For the best Figure Study, 12 × 10 and under, and for the best above 12 × 10:—

334 "Keolantho" ... Valentine Blanchard
383 "Portrait" ... O. Angel

For the best Enlargement untouched, and for the best Enlargement and Negative, both being the work of the Exhibitor:—

53 Enlargement by Solar Camera ... Dr. D. Van Monckhoven.
5 Windsor Castle ... Autotype Company

For the best Genre Picture:—

472 "Cross Purposes" ... Edwin Cocking

For the best Photo-mechanical Prints:—

433 Frame exemplifying Woodburytype Woodbury Company
541a Buildings, Views, Plans, &c. ... Strumper & Co., Hamburg

For the best Instantaneous Picture:—

150 Shipping ... W. Durrant

For the best Frame of Dry-plate Photographs:—

26-34 Swiss Views ... William England

For the best Micro-Photograph:—

105 Proboscis of Blowfly ... Edward Viles

For the best Specimen of Surface Printing from Medal:—

414 Photo-relief Block ... Leon Warncke

Special Medals:—

101 Arctic Views ... W. J. A. Grant
551a Interiors ... Hermann Ruckwardt, Berlin.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

THE following process for silvering mirrors was published by Martin in *Les Mondes*, 17th June, 1875, and is a modification of a process which was published in the same periodical of the 10th December, 1868. A translation of the original paper was given by Dr. Warren de la Rue in the Monthly Notices of the Royal Astronomical Society of December, 1875; but the quantities being in French measures, it will be found more convenient to the general reader to give them in English weights and measures. It may be as well to state that Martin is no mean authority on the various methods employed for silvering glass surfaces, his reputation in regard to construction of reflecting mirrors for telescopes being European.

The following are the solutions which have to be prepared:—

No. 1.—Silver nitrate ... 17.5 grains
Water (distilled) ... 1 ounce.

No. 2.—Ammonium nitrate (pure) ... 26.25 grains
Water (distilled) ... 1 ounce.

No. 3.—Caustic potash, free from
chloride and carbonate ... 4.4 grains
Water (distilled) ... 1 ounce.

No. 4.—Dissolve 44 grains of sugar in 10 ounces of distilled water, add 5.3 grains of tartaric acid, and boil for ten minutes. Next add 2 ounces of alcohol, and add sufficient water to make up to 20 ounces if the silvering is to be done in winter, or to more if to be done in summer.

In No. 4 the sugar is boiled with the tartaric acid to produce the inversion of the sugar, and the alcohol is added in order to prevent subsequent fermentation. To

prepare the surface of the glass for silvering, it is cleaned with concentrated nitric acid, by the aid of cotton-wool which is perfectly free from all extraneous matter. To cleanse the wool, it should be boiled in carbonate of soda, and then be thoroughly washed in running water, finally passed through distilled water, and then carefully dried. The plate is next rinsed in distilled water, and carefully dried. Equal parts of No. 3 and alcohol are then applied to the surface by cotton-wool, and whilst still wetted with the mixture the plate is placed in a dish of water, and all the alkali rubbed off with a badger-hair brush. The plate is finally placed, face downwards, in pure distilled water, being prevented from touching the bottom of the dish by resting on a couple of strips of glass, also well cleaned.

The silvering solution is then prepared; equal parts of No. 1 and No. 2 are mixed in one measure, and the same quantities of Nos. 3 and 4 in another. The mixture in the second measure is then poured into the first measure, and, after stirring thoroughly, the whole is transferred to a dish.

In order to ascertain how much fluid will be required, it is well to place the plate in position in the dish in the way that will be described, and then to fill it up to just below the top surface of the glass with distilled water. When this is done the water should be returned to the measure, and the quantity employed noted. The fourth part of this amount should give the quantity of each of the solutions necessary.

If the directions have been accurately attended to the mixture of the solutions should cause no turbidity (though, in our own experience, this is seldom the case, unless more ammonium nitrate be employed), but should *gradually* pass from pinkish yellow to yellowish brown, and at last to an inky black.

The plate should be kept a quarter of an inch from the bottom, being supported on strips of glass or on wooden wedges. By using the latter the whole of the surface is silvered, the glass resting on its edges; but it should not be placed in the dish till the mixture has been previously poured in. When using wooden wedges it may be found that the silvering solution becomes contaminated by extract from the wood. This may be overcome by coating them with india-rubber solution. When the silvering solution becomes inky black the silvering commences, and, in order to secure evenness of coating, it is advisable to rock the dish from time to time—in fact, almost continuously. In about five minutes the operation will be complete, and this may be known by seeing flakes of silver float up to the surface, and by the liquid below becoming clear. The mirror is now removed and washed under the tap, well rinsed with distilled water, and, finally, set up to dry. The surface should appear brilliant after removing, by a pad of soft wash leather, a slight bloom which may cover it. In some cases, if the potash be very pure, the bloom will be altogether absent. Should the bloom be very adherent, a little jeweller's rouge should be sprinkled on the pad, and a polish should be given by rubbing this circularly. It must be remembered that the slightest trace of damp in the silver is fatal to this operation, as the surface then easily and inevitably scratches. Admirable rouge may be produced by incinerating ferrous sulphate in a crucible over a gas flame, the resulting powder being beautifully fine, and giving a nice polish.

The great secret of success in the process seems to be the nice adjustment between the potash and the ammonium nitrate. When the two are mixed, the former combines with the nitric acid of the latter, producing potassium nitrate, and ammonia is liberated. This ammonia precipitates the silver, and it immediately redissolves it, unless there is not sufficient of it of proper strength. With a deficiency, the silver oxide would be sure to be precipitated, and we might, probably, fail to silver the surface properly. An excess of ammonium nitrate, above that given, will always

supply sufficient for the purpose; but any large excess means slow silvering and a film which is easily abraded. A defect or excess of ammonium nitrate is, therefore, to be avoided. In practice, we have found that, by increasing it 20 per cent. above that given in the formula, a better result is obtainable.

When the amounts are well proportioned, the solution behind the silver, depositing on the surface of the plate, gives a brownish tint to objects reflected in it; when the glass is not properly cleaned, a greenish tint. A properly silvered mirror should be of a deep blue when examined by transmitted light; when it is purplish it is not so opaque, and there is usually something wrong in the mixture employed. The presence of carbonates causes a reduction of the silver in the fluid itself, rather than on the surface of the glass. A badly cleaned surface is shown by a mottled appearance of the deposited silver.

Any mirror may be silvered by this method if it be carefully carried out, and even if the mirror of the heliostat has to be silvered at the back, this process may be employed. As in many other processes, practice makes perfect, and the mirrors we silver now are far better than those with which we commenced.

GELATINE VARNISH.

A CORRESPONDENT of *Anthony's Bulletin* says:—"In return for the many useful hints I get from the *Bulletin*, let me give you a few. They may not be new to many of your readers; but, as I have not seen them in any of the photographic journals, I venture to send them. The article is the same identically with that in use for making the famous carbon picture, a thin solution of gelatine with a few drops of a saturated solution of bichromate of potash or ammonia added, well shaken, and it is ready for use.

"Cover a negative with the solution, dry, and expose to the sun, and it makes the finest surface to retouch upon I ever tried; the pencil marks can be easily erased, if needed. As a varnish for photographs, pencil drawings, &c., it has no equal, and, I think, will make silver prints equal in permanence to any other, as neither moisture, water, nor air, or any of the gases, can penetrate the film. And further, it renders vessels perfectly water-tight, such as wooden baths, dishes, &c. One or two coats, dried and exposed to the sun, are all that is necessary, as the film is not soluble in water, either hot or cold. I have also applied the solution for the preservation of fruits, eggs, &c., with perfect success. It can be applied to a thousand uses not now thought of."

Correspondence.

MONS. BRAUN'S CARBON PRINTING.

DEAR SIR,—Your most valuable journal of August the 24th, with your mention of our establishment, we received only a few days ago. Permit us to thank you sincerely for the friendly remembrance you have retained of your visit, and the very interesting description you have given of our works.

We perfectly agree with you that it seems quite amusing that photographers talk about the process of carbon printing as if it was yet an experiment to be tried, while with us it has been *un fait accompli* for upwards of ten years. We may safely assert that since that time we have worked up more carbon tissue than has been employed by all the carbon workers of the world together. Although we consume at present something like 40 rolls of 4 meter \times 0.80 a day, and though in previous times this quantity would not always have sufficed us, you may take it as an average of our daily consumption during the last ten years. Reckoning the year at 300 days, this would make 400 centimetres \times 80 and \times 25 = 80 square meter (300 \times 10)

= 240,000 square meter in total, which quantity we expect to see doubled within the next ten years.

Now, with regard to the process itself, it remains, of course, in principle, Swan's, albeit we have dispensed with the double transfer, except for our old negatives. It is true that prints detached from caoutchouc paper (the preliminary support of Swan's) excel in vigour direct prints, but then they are not so fine, and we now apply means by which even greater depth and vigour are afterwards obtained. We scarcely need state that we use reversed negatives for direct transfer.

Regarding the pigment tissue itself, we think we have achieved considerable progress since we manufactured it, and it is only recently, and in consequence of the urgent demand of the photographic public, that we have given it in trade. And as we use the very same paper in our own establishment our clients can rely on its superior quality. For the double transfer we manufacture a special tissue different from any one existing. The colours of the pigment tissue are fifteen in number, and we are ready to produce any other tint, provided the order be sufficiently important.

In consequence of the extension which our business has taken since your visit, the firm of Adolphe Braun has changed into the partnership of Ad. Braun and Co., with a branch in Paris, which is under the direction of M. Braun *fil.* This took place in 1876. Since that time we have, among others, reproduced the tableaux of the celebrated galleries of the Haag, Amsterdam, Luxemburg, Florence, and besides we send every year skilful operators to Italy, France, Switzerland, and to the Rhine, in search of the picturesque. Since the foundation of the new company we also work the collotype (Licht-drucht) process, both by means of the hand and steam press, using it chiefly for the reproduction of hand drawings of the old masters. The Woolbury process we introduced in 1870. With Bruckmann in Munich we think we are now the only firm in Germany working this process.

No doubt every friend of carbon (and they are daily increasing) will be pleased to hear that the firm which first took hold of this invention is still in existence, and more alive than ever. Are we not daily preaching that carbon is the most lasting element existing, and should we ourselves be faded and gone? This would certainly not be in harmony with our doctrine. We therefore expect to keep on as long as carbon prints are lasting.

In your number of last week we find an article by the Editor of the *Photographische Wochenblatt*, M. Duby, referring to the carbon process in which it is stated that there was no difference in the sensitiveness of the mono- and bi-chromate of potass, and that, therefore the first might well be employed instead of the latter. Our experience shows very different results and it will be easy enough for everyone to convince himself that paper prepared with the monochromate is not more sensitive than nitrate albumen paper. Still such paper remains longer soluble. We prepared pigment tissue last July with this salt, and found it unchanged in September, and this while the thermometer rose up to 25° Cent. and more. Bichromated paper would at that time have become insoluble within a few days. In summer, when no proper localities are at hand, and when a longer exposure is of no consequence, it may sometimes be of benefit to employ a mixture of the two salts, provided they be pure. The monochromate especially exists generally in a very impure condition, sulphate of potass, being the most general adulteration; and, with regard to the bichromate, it is well known by chemists that it often contains traces of chromic acid and chrome alum, which both tend to render the paper insoluble. Hence the unsatisfactory results which carbon printers sometimes obtain in spite of the most scrupulous attention.—We have the honour, dear sir, to remain, your obedient servants,

Dornach, 31st October.

AD. BRAUN and Co.

A HARD CASE.

DEAR SIR,—A short time ago two "gentlemen" called at my studio late in the evening. They wished to be photographed in a group, and on my suggesting that an earlier hour would give better results, one of them said that he could not possibly come again, as he was leaving town.

I took a negative—one of the gentlemen stirred a little; I took another—this time the other gentleman stirred, but only to a very slight extent. It was now too late to try again, so I told them it was as good as I could get under the circumstances, whereon the gentleman who was going away ordered half-a-dozen. The other said, "I suppose it will do to pay when we call for them." As I had a slight knowledge of him, I said "Yes." To my surprise they both called in about ten days after, when the gentleman who gave the order refused to take the cards, on the ground of their not being good enough. After some words, he offered me half the agreed price. I need not say that I refused it.

I have given the case to my solicitor, and will let you know the result.

This is not the first instance in my practice of parties calling late, saying that they could not come again, and afterwards objecting to the work, and having another sitting at the expense of yours, dear sir, A VICTIM.

A CHEAP AND EFFECTIVE BURNISHER.

SIR,—Strange to say, that when I read Mr. Cherrill's letter of 25th May under the above heading, I was employed in making a burnisher something like his, the only difference being that I use small bolts screwed tightly through the base board, which is of hard wood, and does away with the screw-driver, and allows the plate to be adjusted when hot by turning the bolt by the head from underneath to suit the different mounts, which I think a great advantage. Another convenience, I only suggest, is an oblong hole in the back part of the plate, which will allow the plate to be handled with a small piece of iron, or in all probability the poker, and so save the fingers. Hoping this will be of use to some one, I am, &c.,

Blenheim, N.Z.

JAMES CHERR.

MOONLIGHT PHOTOGRAPHY.

DEAR SIR,—On Saturday evening, October 20th, I was taking some photographs of the moon by means of the solar camera, and obtained some very good photographs very quickly. It occurred to me to try an enlargement by the light of the moon, so I prepared a half-plate with wet collodion, and exposed under a negative for ten minutes, and, sure enough, out came an enlarged image from a quarter-plate negative; in ten minutes I also obtained an enlarged negative from a small transparency, and printed a negative from a transparency in contact with a Beechey dry plate. This took twenty minutes three inches up in the cone of light. I have sent the plates for your inspection. By the same instrument pictures can be obtained by powerful sunlight in the one-thousandth part of a second, therefore the active power of the moon is six hundred thousand times less than that of the sun.

During the next quarter I intend to experiment upon the heat rays of the moon, or try to prove that there is really heat radiated from the moon. It seems evident there are heat rays from our lunar orb, although as yet, I believe, it has not been proved; but I must say its spectrum is identical with that of the sun—from red to violet, therefore. If red is shown in the spectrum, it tells me that heat must be there.

I see by last week's News that a Yankee has been making use of my experiment on lightning for spirit purposes. I can't say that I obtained the form of an angel upon my plates: I got more chimney tops; but perhaps my instruments are not constructed the same as his.—Yours truly, 41, Queen Street, Ramsgate, Oct. 31st. A. J. JARMAN.

[The results obtained by Mr. Jarman, and submitted to our inspection, are exceedingly interesting, and the first genuine examples of moonlight printing which have, we think, been produced.—*Ed.*]

SOUTH LONDON PHOTOGRAPHIC SOCIETY TECHNICAL EXHIBITION.

DEAR SIR,—Kindly permit me to announce that the Annual Technical Exhibition Meeting will take place on Thursday, November 15th, at seven o'clock (admission free), in the Rooms of the Society of Arts, Adelphi.

Also, that the Annual Dinner of the Society (open to friends to attend) will be held at Anderton's Hotel, Fleet Street, on Saturday evening, November 17th.

Particulars concerning the Technical Exhibition, and tickets for the Dinner, may be obtained from me.—Yours faithfully,

EDWIN COCKING, Hon. Sec.,
51, Queen's Road, Peckham.

PHOTOGRAPHY IN DUBLIN.

SIR,—I think it is generally acknowledged that the first impressions which strike a man of keen observation on visiting a city are in many cases more correct than an opinion formed after a prolonged visit; on the same principle, the first glance of a stranger at a portrait may correctly pronounce the complexion too warm or otherwise, as the case may be, whereas the artist who has been scanning every detail for hours could not see it; but, mark, this only applies to the general tone, and not to the detail of the picture; for this reason I think your correspondent, when penning his "Notes in Dublin," would probably have been more correct in his estimate of Dublin photographers if he had adhered strictly to generalities, and not gone into matters of fact and detail. However true this sweeping accusation that we are so far behind photographers in other cities of like importance and size may be, I will not attempt to judge—I will leave that to those more capable to form a comparison; but let us to actual facts; it is here that your correspondent is in such great error, and it is purely for this reason I pen these lines, as an inhabitant of Dublin, and not as a casual visitor who cares little for what the Dublin photographers may think of him. I must forbear speaking individually of any one photographer. Your correspondent, in speaking personally of us, selects from the host of photographers here one who in his opinion excels all the others in portraiture, and that, apparently, for the simple reason that he enameled and embossed his work. If this is the height of excellence in art photography, let us all, certainly, either enamel our prints, or send them to London to be done; it is purely a mechanical process, and only costs so much per dozen—the worst print, from the worst negative ever taken, can undergo the process—and we may then, perhaps, bear a more favourable comparison with those great Continental examples we are to follow. Your correspondent seems totally to ignore the subject of artistic lighting, posing, or technical qualities of the negatives taken by Dublin photographers, but speaks only of the printing processes. In this branch I am aware more can be done than in any other to give pleasing pictures for the public; but it is not to this branch that an art photographer should look. I believe that it is to the get-up of the proof that the Continental photographers owe their popularity. They never fail to avail themselves of every known mechanical process that will help please the public taste, and so certainly should every photographer—it is quite legitimate in business—but, as I before said, it is not on these grounds that I would form an opinion in speaking upon pure artistic photography. The vulgar may admire the gilt frame more than the picture it encloses, but no art critic would think of even mentioning such a thing.

In speaking of carbon printing, your correspondent is still more in error. He says in one case only has carbon print-

ing been attempted here. Now this I can personally deny. There are two licencees of the chromotype process—one of them having bought up the whole of the patent rights for Dublin, with the exception of the other licencee's right. The principal licencee, who paid a very large sum for the process, has worked it most successfully for nearly two years, and the only difficulty he finds is to get his customers to take them in preference to silver prints; but, as far as working it goes, it has proved perfectly successful in his hands. I may mention that this photographer does the only exclusively aristocratic and high-class business in Dublin with customers to whom price is no object. His establishment, however, was evidently beneath the notice of your correspondent, as was likewise that of the other chromotype licencee, who has two large places in Dublin, and does a very extensive general business. Besides this, most of the others have tried or done a little in the Autotype line, and it is, probably, one of these that is the source of your correspondent's information.

As this is not a subject of general interest to your readers, I will not prolong it, but hope, should your correspondent honour us with another visit, he will search for better grounds for his statements, than he evidently had on the last occasion, before he gives them to your English readers as facts about us. A BLACK AND WHITE MAN.

[Our correspondent, we are certain, honestly gave his impressions to our readers, and his experience gives his opinions some weight; but it is evident that in the course of a short visit he has failed to become sufficiently accurate in matters of detail as is desirable. We are obliged to our correspondent for his corrections.—*Ed.*]

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held at the Society of Arts on the evening of Thursday, November 1st, the Rev. F. F. STATHAM in the chair.

The minutes having been read and confirmed, Mr. L. H. SKAN was elected a member.

Some time was spent in nominating officers for election at the annual meeting in December, and several resignations were received.

Mr. FRANKALL then delivered a brief lecture on "Educational Aids by Photographic Exhibits," in the course of which he said he considered that there was a great future in the applications of photography to educational purposes. He thought the correct representation of all objects would be of the utmost importance in training the faculties of the young, who were perplexed and confused by the numerous little streaks and lines which were the artist's means of portraying nature. The young could not distinguish the lines adopted for outlines, and shading from the lines which were supposed also to represent texture. It was not merely the forms were incorrectly copied, but great waste of time to gain the proper ideas, while if subjects were represented by photography, then their fidelity would be at once apparent. It was well known there were great difficulties in obtaining proper copies to teach drawing to pupils. Sometimes the conventional style of an artist has been preferred—a sort of fashion; but the young learner soon turns from the attempts to copy the touches of an artist that, after years of practice, can produce results to please the public, but the student can neither produce a pleasing effect nor any likeness of nature. In the case of blacklead pencil practice too frequently the copies are produced with lithographic inks and chalks. The fine details in the foreground may have the sharpness due to scraping out lights, and from a mere mass of blackness a needle point may scratch up fine lines or give catching lights and indications of detail which the pupil cannot possibly follow, and who produces, after great labour, a woolly or uncertain result, and leaves off quite disheartened. Now, if the student was taught true lines, the means to preserve lights, and to produce shades, then copies produced by photography would give correct outlines, light and shade, and the numerous details of texture in nature to aid in correctly training the faculties of observation. Every means should be taken to give the

young correct examples; and, as it is well known there are periods of fatigue when a change of pursuit is required, so, if the young could be interested, and the teacher stimulated and rewarded, it would be conferring a great benefit. He thought photography might be introduced to give correct forms and indications of structure—not merely for drawing, but to assist in correctly observing. He had hopes some forms of the microscope might be introduced. A cheap glass, and a prepared set of photographs, would enable a vast number of truths to be known, recognised, and verified; and if a number of copies were prepared—say several hundred of the most ordinary objects and structures—the young would know what to seek, and learn, and admire. In this way the beauty of minute living forms, whether of insects or of flowers, would be sources of wonder and delight. The minute flowers, such as the mignonette; the little plants, such as mosses and duck weed; the compound flowers of the daisy, the flowering stems of grasses and corn plants, the pollen of flowers, the leaves of geraniums, &c., the starch granules of the potato, and ordinary malices, would yield great interest alike to teachers and students, if they had plates of the objects they were to look for. A definite set of subjects could readily be made with such photographic guides and cheap magnifying glasses. Abundant interest would be afforded to teachers, who gladly turn to any means to carry on instruction at hours when the faculties are in a tired condition. This proposition, he thought, would commend itself if once it was fairly applied. Referring to the fine microscopic enlargements shown by Mr. Viles, and other subjects in the Photographic Exhibition, he thought the collection itself was a suggestive source of questions as to the education of photographers, amateurs, and the public. If the very fair question were asked when a photograph was to be seen—"How do you expect it will be shown?" few were, perhaps prepared with an answer beyond their own practice. Here we may see photographs without any margin framed to the very edge of the subjects, while the next set would have wide margins and elaborated intervals and lines, forms and colours between the photograph and the frame. Thus the view of the Philadelphia Exhibition was brought up to a gold moulding and then a wood frame. Mr. Payne Jennings had nine subjects, each brought close up to black separations in a black frame; the Royal Engineers had their subjects up to a flat gold mount and frame; Mr. England had white margins and gold. Some were on brown, pale fawn with edges of red lead; others green, like morocco, with elaborate lines and toolings; in some cases the mounts were too brilliant, however pale the tint. In all such cases it would be of great importance if standards of colour could be agreed upon. Radde's *Scales of Colours* and the printings from hundreds of these tints by the stenochromy process were shown, and the words quoted of a reviewer—"that a practical set of tints might be formed to enable the printer and toner to regulate their work—in fact, a photographic actinometer." After giving commercial difficulties to describe and verify delicate tints, and the taste, skill, labour, and expense of preparing Bellow's French Dictionary, he (Mr. Pearsall) alluded to the confusion of colours and colour-blindness of the public. Five per cent. of the people were unable to distinguish colours, and five per cent. confusing or unable to describe them; hence he thought standards of tints and colours of great value. He also thought it would be interesting to know what principles were involved in displaying a photograph. If it were treated as a work of art or as a picture, then it might be framed to the edge of the subject; but if it were displayed by margins besides the tints or colours of the mounts, then arose the questions of the breadth of the margins, what breadth? Should the margins be equal or unequal all round? And whatever the breadth, should there be a greater space at the bottom than the top of the subject? He (Mr. Pearsall) concluded with the hope that the educational aspects of photography might be well considered in the future.

The CHAIRMAN said that at that late hour, with the number of questions and opinions involved in the paper, to be more conveniently discussed at future meetings, he would offer his remarks to confirm most fully the disadvantages of children having copies before them fall of the technicalities of production, whether by the engraving or scraping implements. Undoubtedly the best copies were the sketches and drawings of the best artists, and every touch of the artist's pencil could now be reproduced by photography. The sketches of these great artists would thus be furnished to the public. In the reproductions—from the crayon sketches of M. Angelo, the designs of Raffaele, the simple studies of heads by Holbein, to the blacklead pencil drawings by

Harding, they had abundant sources of examples. In fact, on the subject of enlargements he saw it was possible to have subjects thus produced to be shown by daylight, and not to be dependent upon the transient and expensive means of the lime light. He thus saw a great field if the finest living models were selected for the benefit of art and the artists themselves. It was well known that artists had great difficulties in obtaining models, besides the expense and difficulties of the surroundings. The models were not always in good health, and became weary of the long-continued, strained position of the muscles. That was a subject that the authorities at South Kensington might take up for the benefit of art and artists, and photographic enlargements might greatly advance education.

Mr. MEYERSTEIN thought Mr. Pearsall had given too limited figures to the colour incapacity of people. It had been found in Sweden, after an accident by mistaking red for green, that of the staff of the Company above forty per cent. were found to be defective in colour observations, and this was followed in Germany by examinations that showed above thirty per cent. of the people employed had colour defects. The German Government were taking steps to remedy this state of affairs by making colour knowledge a branch of education.

The thanks of the meeting were given to Mr. Pearsall, and he was assured the questions that had been treated of in his remarks would not be lost sight of. The meeting then adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management of the above Association held their monthly meeting at the new office, 160A, Aldersgate Street, E.C.

The minutes of the previous meeting were then read and confirmed.

A member of the Association having recently died, the application of the widow for relief was then entertained. After receiving the careful consideration of the Board, a sum of money adequate to meet the purpose, proposed by Mr. Siman, and seconded by Mr. Bolas, was carried unanimously.

Grants for various other purposes were then voted, and the meeting adjourned till Wednesday, December 6th.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

THE usual meeting was held on September 4th, 1877. In the absence of the President, Mr. J. B. GARDNER was called to the chair.

On motion of Dr. M. N. MILLER, the reading of the minutes of the last (June) meeting was dispensed with, and the minutes as published in *Anthony's Bulletin* were approved.

A communication was received from Mr. Myer Plan, inviting the members to visit the building formerly occupied by the late Mechanics' and Traders' Savings Bank, where a more suitable meeting room could be had, which was referred to the room committee.

Dr. M. N. MILLER remarked that lately he had experienced considerable difficulty in removing negative films from the glass support by the gelatine process. The negatives were very dense ones, and strengthened by Schlippe's salt. The film seemed to split on endeavouring to strip it, a portion remaining adherent to the glass, and another coming off with the gelatine. He had not tried any other mode of strengthening, and was inclined to attribute the effect to the strong deposit caused by the salt. The Doctor here exhibited plates illustrating the effect. They were prepared by the emulsion process, and the glass thoroughly cleaned with sulphuric acid and bichromate of potash, and treated with talc.

The SECRETARY remarked that he had never seen any films split like the ones exhibited by Dr. Miller.

The CHAIRMAN said that he had taken off films, but never those that were intensified. Supposing it could not be done he never tried it. There are some intensifiers that you cannot print through, even if exposed for half a day; the white or intense parts would not show any action of light to have taken place beneath them.

Mr. ALKAN'S BOOKS exhibited some fine stereoscopic pictures, which were viewed through his very excellent improved hand stereoscopes, shown at a former meeting.

The Section then adjourned to the first Tuesday in October.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—A meeting of the Society will be held on Tuesday next, the 13th inst., at the Photographic Exhibition, 5, Pall Mall East, at eight p.m. On this occasion the medals awarded by the jurors will be presented. This is the last evening upon which the Exhibition will be open to members, each of whom has the privilege of introducing a friend. The Exhibition closes definitely on the 15th inst.

PHOTOGRAPHS OF THE EMPEROR WILLIAM.—"Is it true," asks *Brief*, a weekly newspaper, of which the first number appeared on Saturday last, "that the Emperor William, whose ostentatious piety has often been a subject of comment, allows his photographs to be printed and sold with an inscription consisting simply of the words 'Ecce Agnus Dei'?" This photograph, it is alleged, is taken from a picture by F. Ittenbach, and is issued by the *Photographische Gesellschaft, Berlin, am Donnersplatz*. The Emperor is represented in full uniform except that he is bare-headed, and wears many stars and orders."

IMAGES OF LUMINOUS OBJECTS.—It has long been known that the photographic image of a luminous object is dilated at the expense of the dark parts, or the field itself. This has been merely attributed to a gradual advance of the chemical action (without further attempt at explanation). The phenomenon has recently been studied by M. Angot (*Journal de Physique*). He finds that the dimension of the images increases with the intensity of the light, with the duration of exposure, with the sensibility of the plate, with diminution of the aperture of the objective, and that it is greater when the plate has not previously been impressed by diffuse light than when it has. M. Angot discards the hypothesis of a mysterious advance of chemical actions, and shows how the phenomena are accounted for by the ordinary theories of optics. This variation of the diameter of images is inevitable in practice; to render it very small the operator should satisfy himself that the objective used is applanatic, i.e., free, as far as possible, from aberrations of sphericity and refrangibility. He has only to take account of variations due to diffraction, which may be attenuated by using objectives of large aperture. It is by using an objective without sensible aberration, and of fifteen inches aperture, that Mr. Rutherford has succeeded in obtaining magnificent photographs of the moon.—*Nature*.

POIKILOGRAPHY.—The greatest paper in the whole world engages, nine times out of ten, none but the highest university men to write for it, and the result is, plain articles built up of simple and understandable words. Another—not the most reliable—employs gushers of no decent school even, in most cases, and the total is words of mystery. On this point, nothing is more foolish than for manufacturers of things new to rush into Greek for titles. The present term is new, neat, expressive, and chaste, especially the latter. Well, it stands for a system of producing copies of oil paintings in colours. Since the development of photography, many have been the aims to obtain pictures in natural colours. By the means of coloured glasses, and the employment of light from various parts of the spectrum, partly coloured pictures have been obtained; and that is all. Now, this poikilographic process is at work, and is said to be a method, or so surmised, of colouring photos. by printing the pigments on the backs of transparent carbon prints. As generally known, there are many processes in use for producing copies of oil paintings in colours, one of which may be jotted out as follows:—A common transparent carbon print is obtained, mounted on a temporary supporting paper in a reversed position, when the photographic picture is painted on the back with colours. When dry, an adhesive is applied over these same colours, and the picture, by gentle pressure, made to adhere to the prepared backing of canvas. The supporting paper, first attached to the face of the carbon print, is next removed, when the coloured picture is seen, with the pigments toned down, and blended with the tints of the photo.; and as the photo. is a facsimile of the painting, the picture thus turned out is a copy of the original. Perhaps poiki—we beg pardon, poikilography—is like this system. Certain it is that the poikilographic process is perfect enough to show as its results excellent reproductions of several celebrated paintings.—*Stationer*.

"OVERHEARD IN A 'STUDIO.'—Photographer: "Now, sir, if you'll look a little less as though you had a bill to meet, and a little more as though you had been left a legacy, you'll be a picture."—*Family Herald*.

To Correspondents.

H. B. (Bristol).—We cannot tell you the price of photographic labour in the market at the present time; as we have no occasion to either sell or buy it, it does not come under our immediate attention. You can best ascertain by trying to get an engagement. Examine carefully all the good photographs you see, and try to equal them. Remember, skill enough to make a good income is not picked up easily. You must make much effort, and persevere. We shall have pleasure in giving you information on specific points, but general skill is only obtained by practice and trying to do work equal to the best you see.

L.M.O.—An unusually strong and highly iodized collodion does not produce rapidity. From thirty-five to forty grains of nitrate of silver per ounce in winter, and thirty grains in summer, are sufficient. Quick working is not dependent upon the use of strong solutions. A bath of the normal strength in good condition, an ordinary good sample of collodion, good light, good lens, and strong developer, will give you as much rapidity as you can hope for.

G. E. WALLS.—Your failure with the coffee process described can only arise from neglecting to carry out carefully some part of the instructions, as in careful hands it yields singularly fine results. However, our pages, and especially those of the *YEAR-BOOK*, contain full details of various other dry processes, if you are anxious to try another; but in all cases you must carry out instructions with precision and care. 2. Your prints turning yellow on immersion in the hypo fixing solution probably arose from your placing them in that solution without rinsing them from the toning bath, which was probably acid. The hypo, it is probable, was of insufficient strength, and had probably been used for toning before. It was decomposed, and produced the dirty yellow effect of which you complain. This, too, you see, is due to neglecting to carry out instructions with precision and care.

MINIATURE.—Chloride of gold is made by dissolving pure gold in aqua-regia, or nitro-hydrochloric acid. Gold the weight of a sovereign should be immersed in a mixture of nitric acid one drachm, and hydrochloric acid five drachms, and put in a warm place. This will dissolve the gold. The acid may then be driven off by gentle heat, and the salt crystallized, or water may be added, and the acid neutralized by the addition of carbonate of soda.

COMPETITOR.—The decisions of the jurors appear on another page, and the medals will be distributed, we believe, at the next meeting of the Society, to be held on Tuesday evening. The picture you name has, we believe, received the first medal. We agree with you that such a picture is a credit to the art as well as the artist.

J. B. P. (Manchester).—To your first and second questions we should say No, decidedly. 3. You must bear in mind that the purchase of a lens because it may be had for a low price is not always economy. You may sometimes, by good luck, get a good lens at a low price, but you can never rely on doing so. In almost all cases low-priced lenses are quite uncertain in quality. 4 and 5. We cannot, in these pages, recommend makers by name, but we should prefer the last named in each question.

F. R.—You are using considerable excess of wax. After applying the wax you should rub the plate until there is no wax visible at all. The veil over your print is simply a film of semi-opaque wax. On warming the print gently, and then polishing with a silk handkerchief, it will disappear.

INQUIRER.—Photography as a profession is much younger than those you name in connection with which regular agencies exist. Doubtless such agencies will eventually come. Businesses in photography are often changing hands, and valuations taking place, generally through the means of amateur agency or the aid of friends or acquaintance. The same principles which govern other business matters prevail here as to the number of years purchase. We have been associated with some such transfers in which the price for the business has been two years or two years and a-half of the nett profits. Such a business as you describe ought not to be difficult to sell if well advertised. We shall have pleasure in giving you any information we can in this column.

A. L. BREWER.—Your communication arrived too late for this week's issue; it shall appear in our next. We have always pleasure in fairly giving publicity to both sides of a question, although, as we have reason to know, the plan is a dangerous one in some cases. If the opinions, even if favourable, are not absolutely and uncompromisingly favourable to the photographer whose work you describe, it is apt to provoke an outbreak of malignity unpleasant, if not dangerous. Of his work we have spoken in very high praise; it is amongst the best we have seen. We think the specification in question the reverse of perspicuous, and apparently ringing the changes upon that of Tessie du Motay and Marechal, published some years ago.

C. R. P. VERNON.—Thanks.

Several Correspondents in our next.

The Photographic News, November 16, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE PHOTOGRAPHIC EXHIBITION: THE HANGING COMMITTEE, THE PRESS, AND THE VISITORS.

WHATEVER may be the financial success of the Exhibition just closed, it is certain that, both in respect to exhibits and to notices by the Press, there has never before been so satisfactory a result. No doubt a large number of circumstances go to make up the success of an exhibition, just as much they do failure, and the fact that the main thoroughfare leading from Pall Mall to Charing Cross has been blocked, so far as carriages are concerned, during the whole period of the Exhibition must have very materially lessened the receipts. There is no help for such calamities, as shopkeepers, unfortunately, know to their cost, and in the West End especially the banishment of carriage people signifies very much indeed. Taken altogether, however, we suppose that there has never before been so many visitors to a photographic exhibition in London, and if the collection should pay expenses there ought to be little to grumble at. Only once has this been the case, we believe, three years ago, when the Photographic Society held its first meeting at the same gallery at 5, Pall Mall; and although, if we remember rightly, there was a gain of but a few pounds to the Society, the circumstance of the surplus being upon the credit side of the balance sheet was such a novelty that the fact was long remembered. The next two exhibitions resulted in considerable loss to the Society, and we trust sincerely that this bad example will not be followed, but that we may have to record a favourable result once more. There is no reason on earth why an annual photographic exhibition should not be made to pay, especially if such a collection can be brought together as was seen this year at Pall Mall. For the first time in the history of such things there has been an overflow of contributions, and although it may have been annoying to some that all their pictures were not hung, it is a most healthy sign of the times to see the announcement in the catalogue that "the Committee of Selection regret to say that the limited space at their disposal has prevented them from hanging a large number of pictures which would otherwise have been included in the Exhibition." If photographers will but put their shoulders to the wheel, and forward pictures from which a suitable selection might be made, there need be no fear of the Exhibition not being successful in the future. It is when the Hanging Committee are compelled to hang everything that is sent, and to extend the day of sending in, to secure more, that the collection itself becomes jeopardised, and the standard of excellence is lowered. There cannot be a doubt, for instance, on the present occasion, that, compared to former exhibitions, the general degree of merit was higher than usual, and this in the main we hold to be due simply to the fact that two or three hundred of the lesser contributions were withheld. Many must have been disappointed whose pictures were densely packed downstairs against the walls of the council room, and many again must have been grieved to see works upon which they had spent so much time and trouble not occupying, to put it delicately, so good a position in the room as might have been accorded them. But who is to judge in the matter? They themselves could hardly be impartial critics, and if it were left to any other of their brethren, would the latter have done better than the gentlemen of the Hanging Committee? We trow not. Far be it from us to defend the Committee or their doings; they are recognized scapegoats, and are, indeed, intended to bear the brunt of all sorts of attack. Till the end of time it will be same thing; and if those contributors who have this year made their voices heard in complaint were

singled out to do the hanging in next year's exhibition, plaints and outcries would, we feel assured, be as rife as ever.

Turning from the pictures to the critics in the daily and weekly journals, whose writings have been unusually prolific this year, we would desire to say one word. Although it is very pleasant to read of one's doings, and the reverse to have them ignored, our friends, both fortunate and unfortunate, should remember this: there were upwards of 650 pictures catalogued this year—an altogether unprecedented number—and of these by far the majority deserved looking at. Now, unless a critic came day after day to examine the works, it is obviously impossible for him to pass a fair judgment upon them. And this a critic in the ordinary way cannot do; he pays a visit of an hour, perhaps longer, perhaps even shorter, and then conveys the best impression he can of the collection as a whole to the public. He may have looked at fifty of the pictures in the time. Chance led him possibly to one corner of the room, and here, to his no little gratification, he sees upon the wall a portrait of his old friend Snoots, taken by Blackcap, of Seabourne. It is a very good picture indeed, and down goes the fortunate Blackcap in the *Daily Standard* as one of the best portraitists of the day. Others exhibit portraits just as good, possibly better, but the critic has not the advantage of knowing the originals, and therefore the photographers get no credit. It is the same with landscape pictures. The critic has been to the Lake District or to the Wicklow Mountains during the summer, and he is more than pleased to recognize this or that familiar spot. "Charming landscapes by Mr. Diaphram," appears in the *Morning Telegraph*, and Diaphram next morning hugs himself with the delusion that in this walk of photography he has distanced all competitors. We have nothing to say against such criticism; it must necessarily be imperfect and superficial, and it tells such of the public as are interested in the fact that there is a photographic exhibition open in London which they may visit if they feel so inclined. But we would warn both those who are mentioned and those who are omitted in the criticism that they must not put much stress upon the opinions given. Several of the critics, for instance, omitted all mention of the Arctic photographs, which were certainly one of the main attractions, while others passed them over with a word. The critic of the *Times*, who otherwise gave a very able, if brief, review, referred to the first Niepce as "the French scene-painter," a statement which could not but tend to weaken what he had to say about the early state of photography. As we have said, however, both the Photographic Society and photographers generally are, nevertheless, very fortunate in having secured so much attention in the public prints, for while the criticisms are obviously but very rough and superficial, they attract the outside world to come and look at the pictures. We shall be interested to know how many visitors really have visited the Exhibition, and trust that the Council, or the Hanging Committee, or the Secretary will us give some statistics on the subject. After so many photographers have done their utmost to contribute good work, the best return they can have is to be assured that a larger number of visitors have seen their pictures than was the case on any former occasion.

PHOTO-SPECTROSCOPY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

BEFORE closing this series of articles, reference must be made to some variations in the appliances for photo-spectroscopy. The apparatus already described is more especially adapted to an accurate registration of absorption and bright lines in solar and metallic spectra. It may, perhaps, be advisable to give a few hints on the apparatus which is useful for the examination of the sensitiveness of

scopy, since much has to be learnt by experience and constant practice. It is hoped that this series of articles may help some who intend to pursue the subject over some of the preliminary difficulties which beset myself when commencing this work. There are innumerable paths untrodden in this photo-spectroscopic research; and it is fast becoming a necessity that some of them should be explored, as science in her advance will require them.

FRENCH CORRESPONDENCE.

INAUGURAL MEETING OF THE FRENCH PHOTOGRAPHIC SOCIETY—HOW TO FILTER GELATINE SOLUTIONS—COLLODION ON CARBON PRINTS—LEON VIDAL'S PHOTOCROMES—GILLOT'S PHOTOGRAVURE PROCESS.

THE first meeting of the session of the Photographic Society was held on Friday last, the 9th November. As might be expected, a good deal was said upon the subject of emulsions, which has for some months attracted attention among experimenters and practical men. Carbon printing, and printing in fatty inks, were also the subject of several interesting communications.

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They were reproductions of works of art, ancient and modern, such as enamels, &c., and produced by superposing impressions printed mechanically in photochromic manner. The impressions in various colours are laid one above the other, and on top is a photograph of the work of art in question. M. Leon Vidal renders his paper capable of receiving the colours and photoglyphic impression without being damaged or liable to absorb the gelatinous ink. So well are the copies printed, and so exceedingly like the original, that for some time one can hardly tell the difference. Along with these interesting specimens was an impression, also in colours, of a decorated panel, but obtained by different means. The photochromic image having been first of all arranged upon various stones (according to the number of colours), an impression in greasy ink was taken off from each upon the same sheet of paper, and when all the colours had been in this way secured, a last impression was printed in greasy ink, with all the details and modelling of the design. It will be easily understood how rapid and economical the process is, since it replaces the work of the artist, in a great measure, by photography. M. Leon Vidal also exhibited some impressions in fatty ink of various tints, pulled from a cylinder machine driven by steam power, and furnishing no less than one thousand five hundred to two thousand impressions a day, according to the artistic character of the subject to be produced.

M. Gillot has just completed his typographic photogravure process, by means of which he permits artists to engrave their own works. When a sketch is made upon cardboard, treated with size and white lead, the artist takes a *molette*, or graver, and rolls it over his sketch, making hollow lines; the *molette* is moved in any direction that may be desired, and a fine line is made wherever it passes. By rolling the instrument first horizontally and then perpendicularly, furrows or lines are produced which cross one another; little squares in relief are left in this way. With a pencil, or lithographic chalk of a very hard nature, you then sketch in such a manner that the furrows are left white. To render the depiction more facile, the sketch may be first of all made larger, and reduced afterwards by means of photolithography. Nothing then remains but to have recourse to the photogravure process, which M. Gillot has now employed in his ateliers for some time. A very pretty specimen secured by means of this ingenious system was exhibited to the members of the French Photographic Society on the occasion of which I have been speaking.

ERNEST LACAN.

THE COFFEE-GUM PROCESS.

BY A. BOURGOIN.*

PRELIMINARY FILM.

MANY methods have been advanced for giving to plates the property of preserving their sensitiveness either wet, or in a dry state. I side with those who say that the more one rubs a glass, the more one dirties it. I never take this trouble, which not only takes up time, but leads also to the production of defective negatives. Whatever may be the method or the preparation employed in coating the plate, the preliminary film ensures the most complete cleanliness. Of course, I need not say that it is necessary both for old or new plates that they should undergo a primary washing.

My mode of procedure, after the first washing, is to coat the plate with a solution composed as follows:—

Distilled water	...	...	1000 cub. cents.
White gelatine	...	...	5 grammes

The gelatine should be permitted to swell for several hours, and then dissolved at a gentle heat; when finished, add to the solution—

Iodide of cadmium	1 gramme
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Filter several times till perfectly clear, as in proceeding

* *Moniteur de la Photographie.*

various salts to the different portions of the spectra. As already stated, so long as there are lines of any description which will show, however faintly, in the photographs, these will be sufficient to identify the part of the spectrum impressed. Dr. H. Vogel, of the Industrial School, Berlin, recommends the employment of a direct vision spectroscopic instead of separate prisms, and, doubtless, for some purposes, it is useful; it must be remembered, however, that a direct vision apparatus is not a perfect one. Though a train of alternate flint and crown prisms are cemented together, yet, owing to the different refractive indices, there must necessarily be a reflection at each surface so cemented. This theoretical view has been confirmed to me by Hilger, the instrument maker, whose speciality, perhaps, is the spectroscopic. He states that he has often examined the cemented prisms when a beam of light passes through them, and that he invariably finds a well-defined spectrum at each surface. Evidently, then, this must interfere with accurate results, even in the work for which it is intended. There is a danger of a faint blue image overlapping the red image, and this would give false results.

Personally I should not employ this form for any work. To my mind, it is better to employ one simple prism of large size, and for this reason: the reflections take place undoubtedly at the surfaces, but since neither the axis of the collimator, nor of the lens of the camera, is perpendicular to the surfaces from which the reflections take place, they do not affect the truth of the photograph.

Another important point to consider is the material of which the prisms should be made. The following table will be useful as showing the loss by absorption due to different substances. It is taken from a longer list by the late Professor Miller.

Name of Substance.	Thickness in inches.	Transmission of Spectrum	Relative lengths of Spectra.	Remarks.
Ice	About .5	170.5	74.0	
Diamond ... ..	.032	155.5	59.0	
" ... ..	.017	159.5	62.0	
Quartz ... ..	.16	170.5	74.0	
Fluor spar ... ..	.17	170.5	74.0	
Rock salt ... ..	.75	159.5	63.0	
Silver nitrate ... ..	.75	106.0	9.5	Saturated solution.
Iceland spar ... ..	.35	160.0	68.5	
Faraday's optical glass	.64	101.5	5.0	Pale yellow
Flint glass ... ..	.68	105.5	9.0	
Window sheet glass ...	.87	112.5	16.0	
Hard Bohemian glass...	.18	114.5	18.0	
Plate glass ... ..	.22	111.5	15.0	
Crown glass ... ..	.74	106.5	10.0	Greenish

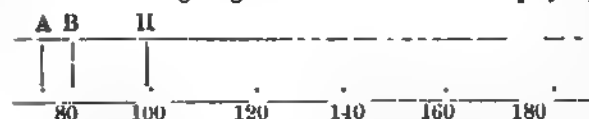
The line B in the solar spectrum is 85 in the scale.

The line H is 100.

In every case the commencement of the photograph was at 96.5 on the scale.

Ice, water, fluor spar, and quartz are apparently the most favourable materials of which to make prisms for obtaining photographs of the violet end of the spectrum.

The annexed figure gives an idea of the scale employed;



A and H are about the limits of the visible spectrum, and it will be seen to what a distance beyond H the spectrum extends where quartz is the medium through which light passes, while how comparatively short it is with flint and crown glass. Iceland spar, too, seems very favourable to use when photographing for the violet end.

For optical reasons quartz is not altogether suitable, the

position of its axes rendering it difficult to cut so as to get rid of double refraction. With Iceland spar the difficulty does not exist to so great a degree, and if the prism be cut in such a manner that the plane in which the only single refraction makes equal angles with the polished surfaces of the prism—that is, is parallel to the base of the prism—perfect definition can be got. A prism of 1½ inch edge ought not to cost more than a couple of pounds.

If either quartz or Iceland spar prisms be used, the condensing lens, and the lenses of the collimator and camera, should be of a material which is equally transparent to the ultra-violet rays. Quartz will answer both, and lenses of any focal length are trade articles. Before quitting the subject of the foregoing table, it will be well to notice the great absorption of actinic rays taken place in a solution of silver nitrate. This, perhaps, may have a greater significance than at first sight appears at all events, it is a fact to be remembered.

If we have a compound which shows signs of being sensitive to the red end of the spectrum, then we must employ a material for the prisms which shall cut off as much amount of the thermal rays as possible. That body which as far as is known, is the most diathermic, is rock salt, and, for accurate experiments, it may be advisable to employ both lenses and prisms of this material. It need scarcely be said that the surfaces will speedily become dulled owing to the affinity the sodium-chloride has for moisture, and it is this fact which renders them rather expensive to use, since they require frequent repolishing. As a rule it will be found that, for the ultra and the ultra-violet ray the white flint which comes from Paris will answer every purpose of the investigator.

Should any one be lucky enough to have a ruled grating on silver or spectrum metal, all this difficulty as to prisms is eliminated. The grating takes the place of the prism, its face being turned at an angle of 45°, with the axis of the collimator and the camera placed to catch the first order of the spectrum. The second, third, and other orders can be brought on the focussing screen by slight twisting the grating. Great care must be used to insure (first) that the placing of the grating is vertical, and also that the ruled lines forming the grating are also vertical. The angle of minimum duration must also be maintained if accuracy be required.

Perhaps it may be as well to explain that a grating gives a theoretically infinite number of spectra, but practically limited to five or six. First we have an image of the slit which is thrown on the grating, then a spectrum which is called the first order; then a second, which is called of the second order, and so on. It may also be well to state that gratings may be ruled on glass or on metal. The former is interposed between the collimator and the camera lens; the latter is used as a mirror. At one time photographic copies of ruled gratings on glass were the market.

Unless a very great number of lines (say 17,000) be ruled to the inch of the metal, it will be found impossible to use any high order of spectrum, unless an acute angle prism be interposed between the grating and the camera lens, when a separation of the different orders will naturally take place, since the ultra violet of the higher will overlap the red end of the spectrum of the next lower order.

In regard to the plates to be used for researches in the spectrum itself, I unhesitatingly recommend washed emulsion plates, which are moistened and then treated for the albumen beer process. They are exceedingly rapid, do not fog, and are sensitive towards the red end of the spectrum. Negatives produced by the wet plate process are poor compared with those obtained by it. A microscopic examination of the absorption lines in the two cases is very instructive. By the former they are ill-defined through the granularity of the deposit; by the latter they are free from this coarseness. It is impossible, of course, to give full instructions in all matters of photo-spectro-

scopy, since much has to be learnt by experience and constant practice. It is hoped that this series of articles may help some who intend to pursue the subject over some of the preliminary difficulties which beset myself when commencing this work. There are innumerable paths untrodden in this photo-spectroscopic research; and it is fast becoming a necessity that some of them should be explored, as science in her advance will require them.

FRENCH CORRESPONDENCE.

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My mode of procedure, after the first washing, is to coat the plate with a solution composed as follows:—

Distilled water	...	...	1000 cub. cent.
White gelatine	...	...	5 grammes

The gelatine should be permitted to swell for several hours, and then dissolved at a gentle heat; when finished, add to the solution—

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* *Moniteur de la Photographie.*

with albumen, then proceed to coat the glass plates that have been dried and sheltered from dust and damp; these will keep indefinitely.

A second means that I have employed is to sprinkle the plate with powdered talc, and then lightly dust off as required. Although this last method is very good, I prefer the coating of iodized gelatine; I prefer it even to albumen, for it is not so inconvenient.

THE COLLODION.

With the coffee-gum process there is no need of a special collodion, for all collodions that work well in the wet process are suitable; I employ the same as I ordinarily use in the studio, and for six years have succeeded in obtaining dry plates by the coffee-gum process that have turned out very successful. The following is the formula:—

Sulphuric ether, 62°	...	...	500 cub. cents.
Alcohol	...	...	500 "
Gun-cotton	...	...	10 grammes
Iodide of cadmium	...	...	4 "
Iodide of ammonia	...	...	7 "
Iodide of potassium	...	...	4 "
Bromide of cadmium	...	...	3 "
Bromide of ammonia	...	...	3 "

I have quite recently experimented with the collodion of which the formula was given by M. Gougenheim (in the *Moniteur de la Photographie*, dated July 16th), and I must here say that I obtained excellent results, better even than with the wet process.

Having dusted the surface of the prepared plates with a badger's-hair brush, and freed them from any traces of dust that might cause spots or stains, I coat with collodion in the usual manner. When the collodion is set, I plunge the plate unhesitatingly into a silver bath, composed as follows:—

Distilled water	...	...	1000 cub. cents.
Recrystallized nitrate of silver	...	...	100 grammes

To which should be added some cubic centimetres of collodion, until saturated with iodide; I then filter to perfect clearness, add freely pure nitric acid (about ten drops for each litre of the solution); leave the plate in the bath till the oily appearance has quite disappeared, place it in a dish containing well filtered rain water, leave it in this about five minutes, and on removing it from this dish, wash it well under the tap in the laboratory, until it is quite certain that no trace of the bath fluid remains, for the failure of dry plates is attributable to free silver coming in contact with the preservative, whatever the latter may be: wash again, and if you judge them sufficiently washed, let them drain for some seconds, and then cover with the

PRESERVATIVE SOLUTION.

It is not my object to enter upon a lecture on chemistry; it is necessary, however, that I should enlarge at length on this point. It is upon this preparation that the whole success of the plate is based; for from this preparation springs the certainty of obtaining, I may almost say, infallibly good dry plates and negatives, which to all appearances will rival those produced by the wet process.

The name of *preservative* is given to different solutions which are employed for preserving the collodion film with which it comes in contact. The layer of collodion that is to be preserved (and this fact is known to all operators, or should be) is not sensitive unless it is sufficiently penetrable to allow the iodide which is enclosed in its molecules to be acted upon and revived by the developer. I succeeded, with a collodion of good porosity, in obtaining excellent negatives with a simple washing, and without any preservative, and this with plates which had been sensitized for over six months. From this we might conclude that a good collodion is the principal preserving agent; but the coffee-gum solution is of great assistance, since the gummy and saccharine substances employed act on the porosity of

the collodion in a mechanical manner. Hence, greater certainty and greater regularity in the preservation of plates should result from the use of these substances. It may be well, however, to remark here that if the preserving solution only fulfilled a mechanical part we could then employ an endless variety of formulae, for they would all have an analogous action on the coatings that they cover and mollify.

(To be continued.)

THE SCIENCE OF PHOTO-CHEMISTRY.*

BY M. R. RADAU.

THE facts that I am about to cite will prove a certain persistent activity in light, M. Niepce de Saint-Victor having discovered many other points which appear to support this hypothesis. A sheet of white paper, previously exposed to the sun, acts in darkness, and even at a distance, on a sensitive preparation. A great number of organic substances, of a transparent nature, have the same property, and we are able to communicate it, although to a less degree, to the surface of a newly-fractured piece of porcelain. May not these mysterious facts be regarded as signs of a *chemical temperature*—that is to say, of a vibratory state determined by the solar rays, and continuing after they have ceased to act? Besides these actions—sometimes of a reducing, sometimes of an oxidizing nature—that light exercises on sensitive bodies, it communicates to them also the property of extracting vapours from bodies to which they have an affinity; thus, iodide of silver and sulphur fix mercurial vapours, after the former have been exposed to the sun. This was the great point in Daguerre's discovery.

We have already mentioned that chemical action is not produced with the same intensity by different coloured rays. We have studied separately the action of the different regions of the pure spectrum, and have found that every substance has certain rays that impress it more than all the others.

Chloride of silver turns black with most rapidity under the influence of violet rays; it is impressed by all that region of the spectrum situated beyond the ray F of Fraunhofer, that is to say, by the blue rays, violets, and grey-lavender, the greater part of the action taking place, however, towards the ray H. It is the same for bromide and iodide of silver. The decomposition of bichromate of potash is obtained by green, blue, violet, and ultra-violet rays. In this case the latent heat and the most luminous rays prove to be almost without action; it is by the violet that the reducing action is performed. But the violet rays can also act as oxidizing agents: they turn guaiacum blue, and combine oxygen with the bitumen of Judea and other essences; they are, nevertheless, the same rays which cause the combining of chlorine with hydrogen. The red and yellow rays, again, are far from useless, only they act in a different manner—continuing and perfecting the work commenced by the violet rays. For this reason M. Edm. Becquerel termed these rays *continuators*, and the others *exciters*. Thus, chloride of silver, lightly touched by the violet rays, turns black afterwards under the action of all the visible rays.

The more luminous rays, again, can effect another action: they de-oxidise and bleach guaiacum turned blue by the violet rays. Sir John Herschell has proved that they are generally the same rays which attack the vegetable colours; the green that we extract from leaves is extremely sensitive to the red rays. M. Baudrimont has discovered that yellow light acts very strongly on litmus blue, red light having the same effect on Prussian blue. According to Dr. H. Vogel and Captain Waterhouse, the addition of colouring materials, such as naphthaline-red, renders the photographic plate extremely sensitive to the direct action of red or yellow rays.

* Continued from page 518.

We see by these examples that the action of light on sensitive substances is much more complex than it at first appeared. It is plain that the action that one ray of an unknown composition exercises on any substance does not permit us to surmise what will be its effect on any other body. A ray that powerfully turns white guaiacum blue would have less effect on a paper impregnated with bichromate of potash, and, *vice versa*, that which bleaches the blue guaiacum has no effect on chloride of gold, and so on. What are the rays that act more especially on the green of plants? This question is far from being solved. We have seen that, stimulated by the sun, plants digest or absorb water and carbonic acid. Here, then, we have certain things analogous to the action of de-oxidising which the more luminous rays exercise on the blue guaiacum; and at first sight it would appear extremely probable that they are the rays that act on vegetable life. The opinions are still, however, divided on this point, and the results obtained by different experimentalists offer most singular contradictions.

If we agree with the experiments of Mr. Draper, of New York, there are rays existing between the orange and the green, that is to say, more luminous rays, which cause the reduction of carbonic acid by the green material of the leaves.* Mr. Draper filled seven glass tubes with water charged with carbonic acid; these he placed in different parts of a solar spectrum, after having introduced into each tube a long, narrow blade of grass. At the end of a certain time he noted the amount of oxygen disengaged from the tubes. The quantities noted in the seven principal colours in the spectrum were as follows:—Red, 0.3 cubic centimetre; red and orange, 20; yellow and green, 36; green and blue, 0.1; blue, nothing; violet, nothing. Placed before a wood-fire, the tubes became heated without disengaging any gas. In comparing the effects produced by free light which had been passed through a screen which stayed their chemical rays, Mr. Draper found them almost identical; on the other hand, the light sifted through an opaque screen, which did not permit any but chemical rays to pass, produced no sensible effect.

The experiments that have been made directly on vegetation made to grow under glasses of different colours have given very opposite results. Thus Mr. Hunt attributes to the blue and chemical rays a beneficial influence on the germination and development of young plants; according to his experiments, under the action of yellow and green rays, the plants became weak and shrivelled. However, says Mr. Hunt, although the influence of the blue rays may be great for hastening the germination and favouring the vigour of vegetation, their action is too stimulating to permit the plants to arrive at complete maturity. The sap appears then to be wholly employed in the production of a beautiful foliage of a dark green; but we are unable to obtain either flower or seeds, unless we substitute yellow rays for the blue ones, the former being the most suited for achieving vegetable development.†

(To be continued.)

IMPROVED NEGATIVE RETOUCHING.

BY O. FRANK E. PRANSALL.†

In giving freely to the fraternity the results of my recent studies on retouching, my only object is the elevation of photography by more truthful work. Having taught several who are now holding responsible positions as negative retouchers, I am encouraged to believe that what I am about to offer will be found by all who adopt it a very great advantage; and if those who may receive any benefit will simply acknowledge it I shall be amply repaid, for by so

doing they will command the attention of those among us who are loth to try anything new. Great difficulty has been experienced in acquiring a perfect knowledge of retouching on negatives from the falseness of the light transmitted through the image by the ground glass screen. It matters not how fine it may be ground, it is but a roughening of the surface, forming numerous little cells, each one producing a minute lens, which throws a different angle of light, not only dazzling and affecting the eyesight, but confusing the judgment, making it very difficult to critically estimate the value of any touch, and often causing the negative to be very much overdone, as one false touch, being inharmonious, necessitates so many more that the likeness is generally destroyed.

To overcome this uncertain and, as many claim, hurtful labour to the sight, and make it a pleasant, intelligent work, discard the false ground glass screen, and substitute for it a washed iodized plate. Every photographer can make one of these screens for his retouching frame by coating a glass as a negative; when ready to remove from the bath, place under the tap, wash well, and varnish, placing it in the frame with the collodion side from you, to prevent its being scratched. This will give a perfect and true screen; its peculiar opalescent character will offer the most critical examination of a negative when placed behind it, and viewed by transmitted light, as it were, the two films seem to amalgamate and closely resemble a negative before fixing. A soft, delicate, steady light is secured resulting in no injurious effects to the eye, revealing most perfectly all the detail in the deepest shadows, with an additional advantage which the artist has of a perfect plane to work upon, all parts of the image appearing at an equal distance. This is not the case with ground glass, in which all shadows or transparent parts, when placing the pencil point upon them, seem to recede, leaving only the ground surface to the view, and therefore making it quite impossible to discover any detail in the deepest shadows. This fact can easily be demonstrated by viewing a negative first with a ground, then an iodized screen behind it.

OZONE IN PIGMENT PRINTING.

BY KARL VON STEFANOWSKI.*

In the last number of this journal M. Adolf Ott speaks of the action of thunderstorms upon bichromated tissue, and recommends the addition of seventy per cent. of alcohol to the bath to prevent reticulation. The phenomenon, according to my experience, only occurs in very soluble tissue, and the costly remedy of making use of seventy per cent. of alcohol is only then advantageous. Pigment tissue prepared from gum-resin or German gelatine does not, so far as I know, yield reticulated images, but it is subject to be acted upon by the ozone contained in the atmosphere during a thunderstorm, and thus to become very difficultly soluble. In July of the present year I found many samples of fresh tissues much more difficult than some which I had kept over for several days in a sensitized condition.

As I could not find the reason for this unequal behaviour in development or solubility, either in the pigment tissue itself, nor in the bichromate bath, nor again in the developing water, I sought about for some other cause, and in the end convinced myself, after several experiments, that the reason of the insolubility was ozone, and the phenomenon was to be met with whenever the bichromate salt was contained in the tissue in large quantity.

If the amount of bichromate salt in the bath is reduced to one or a half per cent., then the ozone in a storm is without action; but it must be remembered, of course, that the exposure must be proportionately longer. In the case of all tissue which suffers from reticulation, it will be found that a diminution in the dose of bichromate may be substituted for the costly means of adding alcohol.

* Phil. Mag. 1844. Deabony, in 1834, had discovered the orange rays to be the most active.

† Phil. Mag., 1843.

‡ Anthony's Photographic Bulletin.

* Photographische Correspondenz.

The Photographic News.

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THE MOUNTS AND FRAMES OF PHOTOGRAPHERS.

We remember on one occasion visiting the studio of a distinguished modern painter to see the pictures he was about sending to the Academy. On such occasions it is common for many friends of the artists and art critics to "go the rounds" of the studios for the purpose of seeing the pictures. On this occasion an art critic who was present when one very fine picture was on the easel under view, exclaimed: "But it is not finished, is it?" "No," replied the painter, "it wants framing!" This simple answer really implied a great deal more than was said, and recognized the marvellous difference in completeness of effect made upon a picture by its *entourage*. Every observant photographer is familiar with the difference made in a print by mounting—a difference which is sometimes startling, even to the artist himself. Important, however, as is the effect of mounting and framing, there is probably no branch of the operation practised by a photographer which has received so little attention, or about which so little is known or understood.

In dealing with the question of mounting and framing as an element in pictorial effect, an initial difficulty is found in the fact that there are no definite canons on the subject to which the student may appeal. The best aid is careful observation of the practice of good men and the examination of effective work. Mr. Poyrall, in his recent address to the South London Photographic Society, on the Exhibition, asked some pertinent questions on this subject. He asked what was the aim of the artist in selecting a mount of given size, proportion, and colour; but he gave no assistance in forming an answer as to what the aim should be.

In referring, however, to the Exhibition examples, he afforded a useful suggestion, inasmuch as, however difficult it may be to lay down definite rules for what should be done, rarely has any Exhibition been so rich in examples of what should be avoided, many of them, by their extreme character, serving a similar purpose to the drunken helot in ancient Grecian education, of frightful examples almost certain to be avoided. Take a frame of stereoscopic pictures on one of the screens, the mounts of which were of a bright scarlet, literally dazzling to the eyes. In like manner the grey mounts of some exceedingly charming studies, sent by a foreign contributor, were bound round the edges with scarlet.

We may pause here to remark that whilst definite rules cannot easily be laid down as to colour and proportion, some few canons will be readily recognized by every one who has given any thought to the subject. It cannot be doubted that the aim of the *entourage* should be to help the picture, and give force to its good qualities; and, if it

cannot always be made to do that, at least it is imperative that it shall not injure the picture, that it shall not distract attention, or compete with the picture in attracting the eye of the spectator. Upon this point we may insist, with emphatic pertinacity, as the first point for consideration in fitting up a picture with its surroundings, that nothing shall be "loud," or obtrusive, or distracting. All must be subordinate to the picture; and hence margins of exasperating red constitute almost the furthest possible divergence from fitness in such a case.

It is customary in this country to look to Continental Europe for examples of good taste in art industries; and the foreign photographs contributed to the Exhibition are, for the most part, very excellent. But, in the matter of *entourage*, we regret to say, many of the foreign contributors were the greatest sinners. In many cases, broad black—or black green—mounts, with a bewildering and distracting multiplicity of lines of gold, and silver, and scarlet surrounding the aperture in which was placed the picture, the black mount being generally surrounded with a black frame, the number of such black frames giving a curiously funereal effect to the gallery generally. A frame of black and gold is often very effective indeed, and admirably suitable for some photographs. It is the prevalent excess of black, with the bedizenment of coloured lines, to which we refer as offensive. A black, ebonised frame, with matt surface, one or two members of the moulding or enrichment being of gold, and a good gold flat inside where it comes into contact with the mount or picture, is for many photographs one of the best frames which can be chosen, and is classic in its traditions, belonging to a class of *entourage* very much used in framing pictures, mirrors, &c., in that English period now so much affected by connoisseurs in furniture generally. But many English contributors to the Exhibition erred in straining after the effect of massiveness and richness. In many cases we find prints in which breadth of shadow prevails, surrounded by a margin of deep photographic tinting. Next to this a broad margin of maroon velvet or flock paper, and outside this a black frame! A dark frame or mount is sometimes valuable in forcing the lights of a sombre picture; but this mass of darkness generally killed the picture, and left it "lying in state" in funereal pomp.

In one instance we may mention where a somewhat bizarre and hazardous surrounding was really effective. A portrait of a lady by Schultz and Suck, vignettied into a grey margin and treated after the Vanderweyde fashion. This picture had a wide margin of maroon velvet and a gold Oxford frame. The maroon mount aided both the force and delicacy of the picture, which was light in effect, and the gold frame removed sombreness.

Some of the mounts had been selected with good intention, but with an imperfect eye for effect. A mount of grey, or greenish grey, is generally very safe indeed; but some of those at the Exhibition showed how possible it is in matters of taste to be nearly right, and still altogether miss rightness. In the cases to which we refer the green tint was bright and assertive, and not only overcame the grey, but swamped the pictures, insisting, by its assertive prominence, on a consideration prior to the picture.

In selecting the mount and frame for a photograph, much depends on the character and tone of the picture. A greenish grey, of a quiet, retiring, unobtrusive tint, is often effective with a print of a reddish tone. But such a mount is better surrounded by a gold frame than a black one. Probably the most effective tint, and the safest in the majority of cases, is the nearest approach possible to that of India paper, carefully keeping to a low tone. For pictures in which masses of shadow or dark tone prevail, as in the Rembrandt style and the Adam-Salomon class of portrait, nothing is more effective than a somewhat massive gold frame without mount, except such as is furnished by a respectable gilt flat inside the frame. Such a frame, or one of black and gold with good gold flat, is very effective,

and gives value to the picture, whilst possessing some decorative value in itself. A frame of carved dark oak is effective with the same class of picture, but the gold flat or mount becomes very imperative in such a case. Gold is of singular value as a harmonizer in uniting or dividing dissimilar colours and textures. It rarely fails to give value to any picture, and rarely fails to harmonize such picture, when hung, with its surroundings. We might safely say to the photographer, paraphrasing a maxim in whist, when in doubt, use gold.

We shall take an early occasion of saying a few further words on mounting, and the relation of shape, proportion of margin, &c., for which we have not space in the present article.

SUCCESSFUL PHOTOGRAPHERS.

THE history of photography as a branch of commerce scarcely extends much beyond a quarter of a century—not much time to build up a colossal fortune. Nevertheless, during that time, more than one unambitious man has retired from the practice of photography with a comfortable competency, whilst some energetic men, still remaining in business, have arrived at that point of commercial success which justifies them in accepting—and their fellow-citizens in imposing upon them—honours and duties which involve the possession and expenditure of considerable wealth. Mr. Alderman Nottage, as we recently intimated, has been elected one of the Sheriffs of the greatest city in the world; and, by his activity and sound judgment on the Aldermanic bench, is manifestly fitting himself well for the honour which must in a few years follow of being chief magistrate in the person of the Lord Mayor of London. Mr. Mayall, whom old photographers remember as one of the oldest of their body, was one of the first, if not absolutely the first, to introduce art and art culture into photography, producing some noble pictorial compositions on Daguerreotype plates. We may remark, in passing, that we should be glad to see them reproduced now if the old plates exist. Mr. Mayall's enterprise, artistic skill, and administrative ability have been recognized by his fellow-citizens of one of the brightest cities in the kingdom, and he has just been elected Mayor of Brighton. As we sat with some others of his photographic friends at his inaugural banquet, amid the barbaric splendour of the banquetting hall of George the Fourth's Pavilion, and gazed, not without a sense of sensuous gratification, on the gorgeous colouring and strange Oriental design of one of the oldest forms of decorative art, the contrast of seeing an advanced representative of the newest of the arts presiding was very striking, although not greater than that suggested by one of the keenest intellects and advanced thinkers appearing as head and representative of a municipal body, a civic corporation, regarded so commonly as the symbol of stagnation and effete-ness. Brighton has, however, done itself honour and service in electing such a man. And photographers will be gratified by the reflected honour obtained by their community in the distinction conferred on one of their number.

PHOTOGRAPHY IN SOUTH AFRICA.

THE progress of photography in remote and comparatively unsettled colonies is always interesting, and to those who contemplate rambling in search of new fields of operation details of experience are instructive. We are indebted to Mr. F. York for a sight of some letters from which we obtain some idea of the progress of photographic operations in the South African colonies. The first letter from which we shall quote is from a gentleman carrying on photography as a profession, dated Knysna, South Africa. After asking to have some goods sent out, he proceeds:—

"Photography is pretty well supported in the large colonial towns. Bruton, Barnard, and Heomar do the leading

business in Cape Town. Another English firm have just started in Cape Town (Atcheson and Tadan), but I have not seen any of their productions. Bowd (Bruton's successor at Port Elizabeth) has come to grief. Brittain is at Graham's Town, Sederstrim at Swellerdan, and Adlard is at his old trade (compositor) in Cape Town. I am still as fond of experiments as ever. I have tried your collodion process (YEAR-BOOK), and the addition of acetic acid to collodion (PHOTOGRAPHIC NEWS), with considerable success. I like Abney's instruction book, also Heighway's; both are very good, especially the former. I was much amused with your lecture on street photography, but cannot make out what kind of stand you use, unless a folding one. I generally use Mason's collodion, but find Capt. Abney's second process (p. 7) give excellent results, with ordinary care—quite equal to the best makes. Stereoscopic photography is quite gone out of use in the colony; cartes, cabinet portraits, and views are almost the only styles practised. Bruton and Heomar do some enlargements occasionally, but they have not become popular yet. I should be glad to hear from you now and then, when any hints of novelties would be acceptable. The Colonial Government have given Bruton some of Chambers's uranium plates for trial. He is much pleased with their action. I have been very successful with the coffee process, but I find it very slow. It requires far longer exposure than stated."

The next correspondent describes some curious experiences in "roughing it." He dates from Glen Heath, on the Plaat River, Cape of Good Hope. After trying several modes of making a living, he tries photography as an aid. He says:—

"When I thought of going back to Belmont I ordered a lot of photo goods, and I must say Solomon sent them out in splendid order, and they were not dear. My first order was a very small one; but I find now I have spent some £30 in this way. Even on this dull farm I have nearly half paid their cost. I have charged £1 a dozen for my wretched attempts; still, if they are not taken 'first-class,' they are nicely mounted and hot rolled, and that is something, as few of the up-country photographers roll their cartes. I began to take sitters almost before I understood how to work at all—as they forced themselves on me. The first I took was a Dutch girl. I was very nervous and anxious, and after exposing (as I thought), took my plate back to the dark room, and poured on the developer—not a ghost of an image came. I waited—and might have waited till now, as it flashed on my mind, I had uncapped, but omitted to raise the shutter. Of course I made an excuse, and took again—this time all right. The thing that has bothered me most (working from a book—Solomon's) is how long to expose. My lens is evidently a quick one, as I have taken a child (open) in four seconds, and that, I think, was a little over-exposed—as nearly all my pictures were.

"I had a brick dark room in an old house, and now I have had to give it up, so I have blocked up the window of the 'Incubator' room, and use that for the purpose. At first all my negatives fogged most woefully, and, on examination, I found little streaks of light came in everywhere. A little Cape plaster settled that till the next rain, and sundry blankets over the door have made it all right; so now I go to work and turn out a few more dozens at £1 each; but the wind bothers awfully, and it seems to me it is always blowing in South Africa. I take great interest in photography, though now working 'against wind and tide.'

"For some months past I have had the PHOTOGRAPHIC NEWS, and read up all about carbon, dry plate work, and what not. I read everything; but the lecture on Lenses, by Zentmayer, like Mark Twain's 'Mighty Old Webster Unabridged,' floored me. I was much pleased and amused with your 'Photographic Difficulties,' which I have just read. I assure you I have difficulties out here; and two

ugly children, and a mother who thought them handsome, nearly drove me mad. I think I took twenty-four quarter-plates of those kids—time after time they came to me; but the camera would not flatter them, and I could not by retouching. At last the mother was a little satisfied, and I got clear of them.

"Solomon sent me four or five gross of crown glass—a great heavy box that I shall never get clear of. I have six dozen quarter-plate glasses, which is all I want. I suppose you are doing very well with your lantern-slides, as I see them spoken most highly of. If I can afford it, and come out here again, I must buy a lantern and go in for a lot of your productions, so as to give entertainments out here. I thought, too, of getting some instructions in photography in England, and going in for good work out here. Perhaps you could help me in picking up suitable things for the colony.

"If I am asked how I like South Africa, and answer truly, I say it is a most miserable, barren place, destitute of all comforts, and utterly unsuitable for Englishmen to live in; on the other hand, the people are genuinely kind and friendly. Money is easier made, and, for a sober man, there is no fear of starving, as there is in England."

Correspondence.

CRITICISM AT PHOTOGRAPHIC EXHIBITIONS.

DEAR SIR,—I am sorry you were at a loss to see the connection between Mr. Montgomery's system of puffing, and the notorious way in which certain papers reviewed, for the last few years, the Photographic Exhibitions of Great Britain. Allow me, then, to explain myself more clearly.

A critic of art must, no doubt, be kind, even when he is obliged to be severe, to those who enter the temple without sufficient preparation. The so-called artist who studies beauty and tries to give a form to the ideal he has, or he thinks he has, before his eyes, deserves indulgence, and has a claim to respect, even when he fails to attain the noble end he aims at. Far from me, therefore, the idea of advocating against his sterile efforts a harsh and cruel treatment on the part of the press. What I want is this: candid appreciation of the work, and due consideration to real merit, without regard to personal likes or dislikes—in fact, *truth*. If the artist has a mission to fulfil, so has the reporter. They both have, each in his way, to enlighten the public mind, and to form the general taste; and when the artist is remiss to do so, the reporter cannot be justified in presenting him to the public as a model worthy of imitation. This can be avoided on one condition: let the gentlemen of the press, before they enter the gallery, throw overboard their friends and acquaintances, then their task will be so much easier. Their eyes will then be opened more to the pictures than to the names appended to them. Their reports will have that flavour of sincerity which they cannot otherwise possess. But will they be able to make that sacrifice?—I remain, dear sir, yours truly,

E. C. DE LA GRAVE.

15, King's Road, Brighton, 5th November.

[If the critics, from good nature or *camaraderie*, praised bad work they would be guilty of a great blunder, which is worse than a crime. But it would be a blunder which would soon cease to have any effect. So long as their criticisms were accepted as possessing weight, they would do all the mischief of false teaching. But the critic with any respect for his own reputation would not knowingly praise bad work. And we do not know of any case in which this has been done. He may, out of good nature, refrain from commenting on such work. And here, possibly, is ground for censure. It may be that useful lessons might be enforced if the faults of defective work were pointed out, and their shortcomings held up to condemnation. But

it becomes a serious question how far the critic is justified in giving pain to some who have done their best, by gibbeting such work as awful examples to be avoided. The evil wrought might easily be greater than the good effected. Many would be discouraged, and not only would the victims themselves probably resolve not to exhibit again, but many more would avoid exhibiting, rather, than risk impalement for the public good. And thus a real evil would result if the exhibitions were injured, for we hold that the public exhibitions are amongst the best aids to progress, and the best educational institution the art possesses. One of the most profound philosophical poets of the day has said, "One of the worst ways to improve the world is to condemn it. Men may o'erget delusion, not despair," or words to this effect—we have not "*Festus*" immediately at hand to verify the quotation. We know it may be answered that a strong man is not afraid of severe criticism; and a poet may be quoted in reply to our remarks, to the effect that

"He either fears his fate too much,
Or his desert is small,
Who fears to put it to the touch,
To win or lose it all."

But all men are not strong, nor are critics infallible; and he certainly errs least who errs on the side of forbearance.—ED.]

THE EXHIBITION: CRITICS AND GRUMBLERS.

SIR,—Will you pardon me if I endorse the opinion of a recent correspondent, who complained that there was a tendency amongst modern photographic critics to be a little too "mealy-mouthed," if you will pardon the term; they seem to see everything through rose-coloured spectacles. The pictures are all "charming" or "exquisitely fine." This is, of course, very nice; but where are the bad or indifferent pictures? I am willing to admit that in the present exhibition there are many very fine photographs; but are there none which are "touched" out of all truth and nature? are there none which are full of incongruities in the vulgar obtuseness of gorgeous accessories? For the stern critic whose object is to teach truth by exposing error there is surely much to censure. Here, for instance, is a fine piece of photography, in which a single figure is engaged in carving or chasing a piece of work, and giving it some finishing touches; but to undertake such work he has dressed himself in a gorgeous, heavy-looking overcoat with collar and cuffs of thick fur. Most effective things to render by photography, but surely an incongruity to be pointed out, that it might be avoided in future. Here is a magnificent enlargement *qua* enlargement, but the original negative has been apparently taken with a lens of short focus, so that the perspective is all adrift, and the picture most unnatural. Here are instantaneous sea pieces with grand clouds and wonderful waves, but the sky and sea, having been printed from different negatives, are strangely disjointed. And then the framing and mounting in many cases are sad examples of offence against any kind of taste. In short, excellent though the exhibition may be, there is much that demands the whip of the censor—the censor who appears to be lacking.

Then as regards the management. The catalogue as it first appeared was a bundle of errors, many of which were never, I understand, corrected. And it is at best strangely lacking in that information which has so often been desired. The blunder of last year, of forbidding any kind of inscription on the frame or picture, which it was understood, and, I think, stated in the News, was to be replaced by reasonable conditions, was repeated, the result, according to rumour, of accident or negligence. The Society never had so many executive officers, do too many cooks spoil the broth?

Then as regards the medals. You, Mr. Editor, have expressed a conviction that they would give satisfaction. I must confess that whilst some are manifestly justly awarded, it is difficult to speak with patience of others.

Doubtless I am a grumbler. But is not a grumbler

needed to point out blunders which it does not appear to be the special duty of any one to condemn or rectify? Apologizing for occupying so much of your space,—I am,
A GRUMBLER.

MONS. BRAUN'S CARBON PRINTING.

DEAR SIR,—In the NEWS of the 9th inst. I find an article under the above heading, the author of which seems to intimate that in my correspondence of the 21st October I expressed the opinion that the sensitiveness of the monochrome and of the bi-chromate of potash is the same. Nowhere in my article is there anything said like that, however, and you will, perhaps, allow me, as a proof, to repeat the passage in question:—

“As to the bichromate of ammonia, so often recommended as being superior to that of potassium, I could not find any advantage in using it; the only superiority I remarked was with respect to the price. A remarkable thing with it is that the single chromated salt is as sensitive as the bichromate.”

I speak here of the chromate of ammonia, and not of that of potash, and everybody knows that it is the merit of Prof. Hunsnik to have evinced that with the ammonia-salt there is no difference in sensitiveness between the monochrome and the bi-chromate.

But as to the chromate of potash, the opinion of my excellent friends, Messrs. Braun et Cie, in Dornach, is mine also, and it is probably merely an error in translation that they thought me capable of confounding the chromate of potash and that of ammonia.

If you like it, I shall send you next week a faithful record concerning some new printing methods.—Believe me, dear sir, yours most truly,

ERNST DUBY,

Editor of the *Photographische Wochenblatt*.

Berlin, November 11th.

[We shall have pleasure in receiving the record mentioned by our correspondent.—ED.]

SUPPLEMENTARY LIGHT AND VIOLET LIGHT.

DEAR SIR,—In the months of October and November, 1876, I happened to assist at several experiments an Italian made at Paris to introduce the violet light in photography.

On November 3rd I was witness when he presented his new method of lighting the photographic studio to the French Society of Photography. As far as I can decipher my short-hand notes of that day, M. Scotellari pointed out that the violet light was the real photogenic light of the highest photo-chemical sensibility; claimed its employment in the photographic art; and invited, in the interest of art and industry, the members of the Society to study its advantages.

The experiences of Fraunhofer, Herschell, Scheele, Stokes, and Prati, he cited, were all distinctly in favour of his claims as to the qualities of violet light. I was greatly astonished that a newspaper of such a serious and instructive tendency as the PHOTOGRAPHIC NEWS had reproduced, in No. 999, the assertion somebody published a short time ago in a certain photographic newspaper, “that the coloured light in question was one of the components of white light, and that, unless a part could be greater than the whole, there could be no advantage gained in using it,” without rectifying this assertion.

Violet light is as well a component of white light as red, orange, yellow, or green; but anybody knows that bright yellow or orange glass is only good for the dark room, and, therefore, the pretended happiest suggestion of employing the bright yellow glass in the studio is a great mistake. A reflect only of the above named colours—red, orange, yellow, or green, coming from the outside of the studio, are noxious to any operation, and under no other light “the model will appear in all the most lovely shades,

and the exposure will be one half than under violet light.” The other components—blue, indigo, and violet—are advantageous. Blue less, because it contains green; violet the most, because of the actinic rays it contains, invisible to the eye, but possessing the greatest chemical intensity. If Scotellari, confirmed by the long and deep experiences of the chemical and physical authorities named, claims for this component of the white light the quality of being the real photogenic light, these claims should not be doubted before making as long and deep studies as these authorities.

That the time of exposure may be reduced under any light—ordinary or extraordinary—but in equal circumstances, according to the stop, is so old and well known that the assertion of readiness to defend this fact is more than superfluous, and the claim of this fact as a new invention is amusing.
G. P. B.

S. SCOTELLARI'S USE OF VIOLET LIGHT.

DEAR MR. EDITOR,—When I read in your esteemed issue of the 26th of October last that Signor Scotellari, the inventor of a mode of using violet light in photography, was in our country trying to secure converts to his application of lighting, which he seemed to have made his especial study, and that he had at his fingers' ends many plans and contrivances such as could only have been devised by a clever and experienced photographer, I felt very curious and interested. A fortnight ago Messrs. Marion and Co. announced Signor Scotellari's visit to my studio. With military punctuality, the Signor keeps his appointment, enters the studio, and, in a business-like way, sets to work—to demonstrate the advantages of his patented “opérateur sensible,” or lens-cap.

The trials were made in the following manner:—The half of a double plate was exposed fourteen seconds with the usual cap; the other half, under the same conditions, was only exposed seven seconds, and after the sitter left his place an after-exposure of four seconds through the violet medium took place. The negatives produced in this manner were developed, fixed, and printed without retouching by my men in the ordinary way, and I must confess my astonishment to find, on the following day, that none of the prints obtained by the Signor's process in half the time were inferior to those produced by our ordinary *modus operandi*; thus our experiment proved very successful by gaining fifty per cent. on the usual exposure.

A second trial was made with the Signor's special chemical preparations—extra rapid collodion, highly sensitive bath, developer and intensifier—in the practical result of which I found a gain of thirty per cent. on our usual exposure.

I ordered at once three cases of these chemical preparations through Messrs. Marion and Co., and I am perfectly satisfied with the happy results: my negatives are much improved, yielding vigorous and brilliant prints, the rapidity of the Signor's chemicals enabling me to obtain splendid negatives of children in two or three seconds in this very dull weather. Numerous orders for porcelain ivory miniatures, enlargements, &c., have been lately secured, which could not have been obtained without these extra quick chemicals, the price of which is put down at the moderate sum of forty-five shillings the set of about eight pints of solution—less than what we pay now at wholesale dealers.

I state these facts for the good of my fellow-photographers and amateurs of the noble art. I advise them to try the lens cap and a set of chemicals in question, for in so doing they will be able to raise the standard of their work, and derive inexhaustible pecuniary benefit and great moral satisfaction by evincing at the same time a full appreciation of Signor Scotellari's important inventions.—I remain, sir, yours truly,
LOMBARDI.

GELATINE VARNISH.

SIR,—Your quotation in the *Photographic News* for November 9, from *Anthony's Bulletin*, will, no doubt, prove a useful suggestion to many who do not confine their operations to mere routine, although it is one which has probably, ere now, occurred to many a worker in the carbon process.

The solution of gelatine containing a small quantity of bichromate of potash, poured over the photographic negative (or, indeed, any other surface which it might be desired to protect), and exposed to sunlight, would, no doubt, form an insoluble and impermeable varnish.

Would not, however, a solution of gelatine in which alum had been also dissolved answer this purpose still better? A well-known property of alum is to render gelatine insoluble. At the same time it would be perfectly colourless, and free from the objection of staining, irritation of the skin, &c., which accompany the use of bichromate, while it would probably offer an equally convenient surface for retouching.

On account of the time required by the gelatine to dry, negatives so varnished should, of course, be carefully protected from dust, until the complete desiccation of the gelatine.—I am, &c.,

HENRY WILSON.

[The use of alum would not, we fear, be so beneficial as our correspondent supposes, for two or three reasons. Alum, if added to a solution of gelatine in efficient proportions, would tend to coagulate or curdle the gelatine, and render its application difficult, whilst the insolubility of the film would not be complete. The best addition for such a purpose would be chrome alum, a very small trace of which confers insolubility on a film of gelatine; and its tint being very slight and actinic—rather than non-actinic—would give it value when applied as a negative-varnisher.—Ed.]

RETICULATION IN CARBON.

DEAR SIR,—Referring to my recent letter in your esteemed pages, instead of one ounce of bromide of potash to one ounce of water, I think you will find it should have been one ounce of bichromate of potash to one hundred ounces of water, which I was using for sensitising my tissue.—Yours truly,

Montreal, September 24th.

JAMES INGLIS.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE first meeting of the session of this Society was held at the Water Colour Gallery, Pall Mall, on the evening of Tuesday, the 13th inst., Mr. J. GLAISHER, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed, the following gentlemen were duly elected members of the Society:—Messrs. H. B. Berkeley, J. J. Witcomb, E. C. de la Grave, Lafosse, A. E. Durham, Percy Vernon, T. D. Bingham, and C. R. Livermore.

The CHAIRMAN then proceeded to distribute the medals amongst the gentlemen to whom they had been awarded by the jury. The recipients were cheered heartily by the audience as each advanced to receive his medal.

Calling first for Mr. Robinson, the Chairman said (referring to No. 281): "This picture is a very excellent example of combination printing from many negatives. The difficulties which the production of pictures by such means present have been in this instance most skillfully overcome, and the result is an undoubted success. The general design of the subject is well conceived and artistically carried out, and in the concentration of light upon the figures, an effect similar to what Rembrandt painted has been very happily produced; and in all the arrangements of detail this photograph gives evidence of an artistic aspiration successfully realized by photographic means."

Proceeding with his duty, the Chairman called the following gentlemen in succession, accompanying each medal with a few remarks.

Mr. G. Nesbitt (241).—"With a few simple materials a picture has been produced which satisfies the artist in its composition, the public in its sympathy, and the photographer in its mani-

plative skill, and, of its kind, is another successful example of the pictorial capabilities of photography."

Mr. Bridgman (117).—"These are small landscapes, but full of delicacy, showing an appreciation of the beautiful in nature. Art and science in these studies have both been utilised to produce a most happy result."

Mr. Payne Jennings (501).—"The characteristic feature of the landscapes by this exhibitor is the harmony which prevails through the entire work. Force of foreground with soft distance, exquisite detail combined with aerial gradation, well chosen points of view evincing pictorial taste, and, to sum up all, great refinement in the conception and treatment."

Mr. Valentine Blanchard (276).—"This portrait is valuable in illustrating the suggestiveness of attitude as indicative of the sitter's character, and hence great praise is due to so artistic study."

Mr. Valentine Blanchard (334).—"In this, a single figure subject, the severities of classical art have been exercised in the arrangement of the pose, and in the folds of the drapery, also in the general treatment of the picture, which looks like copy from some work by a classical painter, and so much the more merit is due to a photographer for producing so fine a work."

Mr. O. Angel (388).—"This is not only an excellent example of the Collodion Transfer Process, but, as a study from life, admirable for the successful imitation of the style of the painters Reynolds and Gainsborough. Softness and delicacy are the special features of this work, the result being that there is an absence (especially in the face) of extreme dark shadows, as the picture is very satisfactory."

Dr. Montkoven (35).—"A most perfect enlargement, showing that when a good original negative has been secured, possessing the best qualities, the system of Dr. Montkoven can produce an admirable fac-simile."

Autotype Company (5).—"A very good example of enlargement by an autotype process from a negative evidently taken with great care and attention to pictorial effect."

Mr. Edwin Cocking (472).—"This is a successful attempt to illustrate an incident of a dramatic character, where the value duplicate lines in composition help to illustrate the subject. The picture evinces a sound knowledge and careful application of the canons of art in its arrangement."

Woodbury Company (438).—"Very wonderful results from appliances which would appear almost impossible to realise."

Mr. Ruckhardt (541A).—"Architectural subjects treated in most efficient manner, showing that none but an experienced architect could have chosen such surpassingly beautiful point of view, with photographic skill of a very high order."

Mr. W. Durrant (150).—"Instantaneous views of shipping evincing great skill in arrangement of position, and decision in the selection of the proper time to take the photograph."

Mr. William England (26-34).—"As specimens of dry plate work these views are perfect; and when the various difficulties arising from local colour affecting distances, combined with foreground colours of a totally different nature, are considered they show that some mastery has been obtained over dry plate work when put into competition with wet."

Mr. Edward Fyles (103).—"An exceedingly clever enlargement from a microscopic negative, showing great perseverance in finally accomplishing one of the most difficult tasks which photography can undertake."

Mr. Leon Warnerke (414).—"A specimen of creative skill and inventive power which must result in great revolution in the illustrations to literature and science."

Mr. W. J. A. Grant (101).—"Extraordinary examples of photography under overwhelming difficulties. The pictures are good that no one thinks for one moment of the real trouble attending photographs under such conditions. They are real fine specimens of photography."

M. M. Strunper and Co. (551A).—"The most successful specimen of mechanical prints by the agency of photography yet seen."

The large company spent the remainder of the evening examining for the last time the noble collection of photographs which form the exhibition.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual general meeting of this Society was held in 5, Andrew Square, on the evening of Wednesday, the 7th inst., Mr. JOHN LESSLIE, President, in the chair.

The minutes of the previous meeting were read and approved, and the following members were admitted ordinary members.

Messrs. G. J. Webster, R. W. Huie, J. H. Forbes, W. Gray, W. Mitchell, Walter J. Jones, John Bonar, and J. Denovan Adams.

The PRESIDENT laid on the table several copies of "A Treatise on the Spheres, with the Theory of the Sun and Moon, and the first book of the Geography of Claudius Ptolemy, of Alexandria," reproduced by a photo-mechanical process by Senor Jose Julio Rodrigues, of Lisbon, which had been forwarded for presentation to the Society.

The SECRETARY then read the Council's Report for the past year, which was as follows:—

"Report of the Council of the Edinburgh Photographic Society for the year ending 8th November, 1877."

"Your Council, in presenting this the eighteenth annual report, have pleasure in congratulating the members on the continued prosperity of the Society. During the year the Society has lost by death five members, including the Hon. W. H. Fox Talbot, who may, so far as this country at least is concerned, be considered the father of photography; and the Rev. D. T. K. Drummond, one of the most successful amateur photographers, and most genial of men included in the roll of membership of the Society. By resignations from removals, and other causes, twenty-nine; but there have been added seventy-three ordinary members, showing a net gain of thirty-nine, giving a membership of three hundred and twelve at the present date, as against two hundred and seventy-three at this time last year.

"During the session there have been held in all seventeen meetings, including nine ordinary, five out-door, two popular, and the annual excursion to Almond Dell. [The attendance throughout the year has been highly satisfactory, and while the Council would have been pleased to receive a larger number of papers of a practical nature, they cannot help congratulating the Society on the work that has been done.

The following papers have been read at the ordinary meetings:—(1) 'The aims and objects of photographic societies, with suggestions for increasing the prosperity of our own,' by Mr. E. R. Yerbury. (2) 'The works of Karelina,' by Mr. Norman Macbeth, A.R.S.A. (3) 'Our out-door meetings,' by Mr. James Crichton. (4) 'The platinotype process,' by Mr. T. Rodgers, St. Andrew's. (5) 'The ventilation of photographic studios,' by Mr. John Laing, F.R.S.A. (6) 'A few experiences in the studio,' by Mr. Peter Low. (7) 'Odds and ends,' by Mr. W. T. Bashford.

"During the session there had been three distributions of pictures, contributed respectively by Mr. James Howie, Mr. W. H. Pillans, and Messrs. Nimmo and Son. The Society has also been indebted to Mr. A. L. Henderson, of London, for the exhibition of a series of beautiful enamels; to Messrs. Kemp and Co., for new form of sciopticon; to Mons. Ganz, of Brussels, for a series of transparencies for educational purposes; to Mr. Tunny and Mr. Paton, of Greenock, for pictures in illustration of the supposed method of lighting adopted by Mr. A. Karelina, of Russia, in the production of the picture to which was awarded the gold medal at the Exhibition; and to Mr. J. M. Turnbull, for an improved form of actinometer.

"The out-door meetings were held at Cadzow Forest, Bothwell Castle, Arniston, Aberdour, and Largo. The popular meetings were largely attended. The first was a series of views illustrating Aberdeen and its surroundings, by Mr. G. W. Wilson; the second, a series of views illustrating the late Arctic Exhibition, the lecturer on both occasions being Dr. John Nicol.

"Your Council acknowledge with gratitude the liberality of Mr. Lessels; Mr. Pantan; Mr. Karelina, Russia; Mr. Gutekunst, Philadelphia; Mr. H. Warner, Wales; and Mr. R. Phillips, India, for their contributions of photographs which have been added to the Society's collection. Your Council have much pleasure in expressing their gratification with the results that have arisen from the presentation for the first time of a high-class print to every member of the Society, as well as the supplying of an equally valuable work of art, at the cost of production, and they take this opportunity of expressing their thanks to Mr. Nisbet, of Bournemouth, and Mr. Adam Diston, of Leven for the use of their negatives for that purpose.

"Your Council in their report of last year referred to their then proposed exhibition of photographs, and expressed a hope that it would reflect much credit upon the Society, and, at the same time, do much to give a new impetus to photography in our midst, and they have now much pleasure in congratulating the Society on that Exhibition having proved a success far beyond the expectation of its most sanguine promoters.

"In conclusion, your Council cannot help congratulating the members on its present highly prosperous financial position, as, notwithstanding the fact that the presentation prints have entailed an expenditure of nearly £18, the Treasurer's accounts show a balance in favour of the Society of £54 15s. 1d., against £36 19s. 3d. last year."

The TREASURER also read his report, and both were unanimously approved. The meeting afterwards proceeded to the appointment of office-bearers for the current year, and the following gentlemen were elected:—

President—John Lessels.

Vice-Presidents—Dr. James A. Sidey, George A. Pantan.

Secretary—H. H. Pillans.

Corresponding Secretary—W. T. Bashford.

Treasurer—Alex. Mathison.

Lecturer—Dr. John Nicol.

The four members of Council appointed in room of those who retired by rotation were James Henderson, W. Gilmour, M. G. Dobbie, and J. Moffat.

It was resolved to hold a special meeting on the 16th inst., when Mr. York, of London, would give an exhibition by Keevil's patent lantern; and after the usual votes of thanks the meeting adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held in the Memorial Hall, on Thursday evening, the 8th inst., when Mr. G. T. LUND, Vice-president, occupied the chair.

The minutes were read and confirmed, and Mr. Colin Mather and Mr. John Chadwick were elected members of the Society.

Mr. J. W. LEIGH read a paper on "A Process of Reducing Silver Chloride to the Metallic State" (in our next.)

The SECRETARY read the following note from Mr. J. B. Payne, and handed round a specimen print which formed the subject of the communication:—

"November 6, 1877."

"DEAR MR. ADIN,—I herewith send you two prints, as promised. I have long been interested in the matter of fading of photographic prints, and had come to the conclusion that, all conditions being properly fulfilled, a silver print was just as permanent as any other; but these conditions imply that you must begin with the manufacture of the plain paper, and go right through the various processes from beginning to end with the greatest possible care.

"Then, again, I believe that there is some sort of an unexplained influence on the part of the negative; some negatives, although appearing very good ones, do not produce satisfactory prints, and, again, I have oftentimes thought that a print taken from a weak negative faded soon. In the matter of toning solutions I had pet ideas, and as regards 'washing after fixing,' I am sure that it is possible to, and that operators very often do, wash too long. A great deal depends, too, upon the quality of the solution that a print is mounted with, and the material it is mounted upon.

"I was very much interested by a paper given by Mr. Brothers, at one of the Society's meetings some time ago; and, reasoning from what I saw and heard on that occasion, and also from my own experience, and from the large amount of information which I had obtained from photographers, both professional and amateur, I had come to the conclusion that the permanency of a silver print depended upon the purity of the materials employed, and the careful manipulation of the operator, but the two prints I send you herewith completely upset all my theories. They were printed by Mr. Dixon, and I have his assurance that he used extraordinary care with them. Mr. Dixon is a gentleman of considerable experience, and is a most painstaking operator. He was interested in what I had mentioned to him from time to time regarding the fading of prints, and, in response to a few remarks I made to him not long ago, he kindly printed these two pictures for me. In a note, sent to me this week, Mr. Dixon says—'I should have expected a long tenure of life for at least the toned one.' I enclose details of particulars, and am, yours faithfully,"

J. BUXTON PAYNE.

"Particulars Relating to the Two Prints.—They are printed from the same negative on the same albumenized paper. It was pink tinted. Both floated on the same sensitizing bath. Printed to exactly the same depth. Washed together. Fixed together and washed together. In fact, they agree in every particular with each other as precisely as possible, except that one is toned and the other is not toned. The one that is toned is No. 1, and it was toned with chloride of gold and carbonate of lime. They

were printed in the second week of July of this year. They were both mounted in precisely the same manner; that is, by touching the margin only a quarter of an inch all round with mounting solution, and, being on the same mount, have consequently been exposed to the same conditions of atmosphere and light.

The Scriptures.—It may be interesting to some members who work the scripticon to know that Mr. Woodbury recommends that the two pieces of glass which protect the flame should be made especially of toughened glass, which, he says, is not affected by heat, and therefore all chance of breakage is prevented. I have tried it with success.—J. B. P.

The prints exhibited were two portraits of a lady from the same negative, vignetted with a dark margin. The autotyped print retained its original colour and other qualities throughout. The toned one also exhibited no appearance of fading as far as the portrait was concerned, but what had been the dark margin had almost entirely disappeared.

It was suggested by several members that Mr. Payne's communication might perhaps afford a clue as to the cause of one margin having faded, and that it might have been printed under much the same conditions as a print from a thin negative—that is, quickly, in a stronger light than the other; but, in the absence of any statement to that effect, the subject was not pursued further.

Mr. W. J. CHADWICK exhibited one of Mr. W. B. Woodbury's new and ingenious tourist cameras.

Mr. LISON showed some specimens of albumen films stripped from their original paper support by a friend of his.

Mr. McCART, on behalf of Mr. F. York, exhibited one of Keovil's patent lanterns, in which the members appeared to take great interest.

Talk in the Studio.

FIRE.—We hear that a fire broke out in the studio of Mr. S. Fry at Surbiton, and destroyed it, together with all the negatives, amounting to some thousands. The fire was discovered on Sunday morning, and is thought to have originated in the frame room. The negatives and stock were well insured, but it is doubtful whether the amount will cover the loss.

LECTURE BY A PHOTOGRAPHER.—Mr. W. Marquand delivered a lecture on Tuesday evening, Nov. 6, in the hall of the Working Men's Association, Guernsey. The subject chosen by the lecturer was "Fire." The lecturer commenced his discourse by making reference to heat and its properties, which, as he said, were almost inexhaustible. The heat of the sun was next treated by the lecturer in a very able manner. The stars might, Mr. Marquand said, all engage individual attention, but he would return to the earth and engage the attention of his audience briefly to volcanoes, electric heat, and other cognates. After disposing of this part of the lecture, Mr. Marquand proceeded to give the origin of fire. The next item treated was the enquiry, "What is fire?" This particular clause occupied the greater portion of the lecture. The other portions of the address composed the veneration with which fire was looked upon in early days, until it became a thing of worship. The concluding stage was occupied in a distinct and clear enunciation of the dangers of fire to the human body. Mr. Marquand treated the subject throughout in a very able manner. Indeed, we consider the lecture to be as good a one as we have heard for some time. Everything was put in the most simple manner, so that every one present could understand it. A vote of thanks to Mr. Marquand was very heartily responded to.—*The Guernsey Mail and Telegraph.*

PHOTOGRAPHY AND FORGERY.—An important capture of bank forgers has been made in Paris. The Banque de France issues notes in blue, in order to make photographic reproductions difficult. A photographic plate, however, was seized, the blue in the original having probably been changed by suitable reagents. Forged notes, printed from an engraved stone, and presenting some inaccuracies, led to the discovery of the forgers, who had probably put these notes in circulation to acquire means for the manufacturing the more perfect articles.—*Printing Trades Journal.*

DANGEROUS PHOTO. PAPER.—Silvered paper is dangerous to leave lying about loosely. It easily takes fire, and can't be smothered out. We know of a gallery last month that came near being no more by the silver paper taking fire while being dried. Scraps and cuttings come under the same head.—*Practical Photographer.*

To Correspondents.

COL. R. C. R. B. (Gwalior).—We are always desirous of obliging our readers, especially those who, living in remote places, have not the usual facilities of photographers living at home; but our correspondent in Gwalior so far transcends the bounds of reason, that we fear we cannot oblige him. He asks us to give in this column information which would require a whole number of the *News*, and then begs us not to refer him to back numbers nor to any book, but give him the information in detail at once! He first of all conceives an absurd and almost impossible process, and then asks us to provide him with formulae and instructions to carry it out. To produce enlargements he thinks he would like to produce the transparency large, using waxed albumenized paper, and from such paper transparency produces a similar paper negative by superposition. Having conceived this bright idea, he asks for instructions how to do it, the best formulae, time of immersion, exposure, &c. A very little thought should have satisfied our correspondent that if he could produce from his small negative a fine enlarged transparency on albumenized paper, he could produce by the same method a fine paper negative, or a fine print, without producing the transparency. He wishes to get rid of the collodion transparency. Well, he may get rid of it by using albumen or gelatine, but the great improvement in modern enlarging is due to the use of a fine, delicate, textureless transparency. If our correspondent knows of any method of producing an enlargement of that character on albumenized paper, it is more than we do. He may produce an enlarged transparency on collodion, and print from that on albumenized paper, and so secure a good paper enlargement. Our correspondent next wishes for complete and easy formulae for the collodion and relative emulsion processes, and also instruction for the carbon process, with details of how to prepare and use the materials in each. Now for these things we must refer our correspondent to many back numbers, or, simpler still, to our *YARN-BOOKS* of the last few years. By way of adding to the reasonableness of his request, our correspondent admits that he is not a regular subscriber, as he on some Indian stamps for a copy of the paper containing answers to his queries.

E. H. D. (Boston).—We are somewhat surprised at the length of your exposures in producing solar camera enlargements on carbon tissue. The solar camera of Dr. Van Monckhoven is doubtless a much more rapid instrument than Woodward's; but we seriously think that would account for all the difference. At Mr. Mayall's establishment, at Brighton, they are producing fine prints on carbon with a Monckhoven instrument in four or five minutes' exposure. With the fine sunshine of America we should have expected much greater rapidity than you mention. The first record of enlargement direct on carbon tissue appeared in our pages just eleven years ago. At that time Mr. Swan prepared sensitive tissue, and sent to Messrs. Holroyd, of Harrogate, a distance of eighty miles; two enlargements were made in the ordinary solar camera (Woodward's)—one for twenty minutes, the other for five-and-twenty; the tissue was then sent back to Mr. Swan to develop. That for the longer period was hopelessly over-exposed. But one of the great points of gain in the present day is the advantage taken of the progressive action of light, which continues in operation if the tissue is kept a few hours in the dark after exposure and before development. A description of Dr. Van Monckhoven's solar camera appeared in our pages on December 17th, 1869. His condenser is, we believe, at least twice as powerful as that in the Woodward camera. We are glad to hear that carbon work is gaining ground in America in spite of opposition.

A NON-CORRESPONDENT, ARKUS, DRUGGIST, F. H., D. N. R., and others.—There is much justice in the remarks of some of our correspondents regarding the medals, but no good purpose could be served by filling our space with anonymous letters on the subject.

B. F. G.—You are quite at liberty to colour a photograph at the back in any manner you please; there is not, so far as we know, any patent in existence which can restrict you. The most effective style, we think, of working out this principle is with oil colours. If water colours are used, the material employed to make the print transparent generally turns a little yellow, and spoils the delicacy of water colours, whilst it only very slightly affects the quality and general effect of oil colouring.

OLD SUBSCRIBER.—The Woodburytype process most nearly resembles silver printing in its results. It is, of course, much cheaper than silver printing, but how much we cannot tell you. You will ascertain by writing to the Company. Photo-collographic printing also gives good results. The same company, or the Autotype Company, will undertake it.

A. L. O. E.—We do not consider gum benzoin alone the best gum resin for negative varnish. About forty grains to the ounce, we should think.

M. N. wishes to know what is best to apply to the surface of water-pipes to make them slightly. This is scarcely a photographic question, and one we cannot answer with certainty. Certainly not paint. We should think blacklead would answer very well.

C. R. P. VANNOY.—Duly received. Many thanks.
A. S. B., FOLDS, JUN., and several Correspondents in our next.

The Photographic News, November 23, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE ENGRAVING OF PHOTOGRAPHIC PICTURES—LITHOGRAPHY AND PHOTOGRAPHY—THE PROGRESS OF ELECTRIC LIGHTING.

The Engraving of Photographic Pictures.—We have already referred to one successful feature of the recent Photographic Exhibition, namely, the large number of press notices; and seeing that the collection was so well visited during the whole of its existence, we cannot but suppose that from a financial point of view the Exhibition has also been satisfactory. But there is one other point to which we would refer, for it is one deeply interesting to photographers in general. As our readers know, photographic studies are sometimes engraved. Occasionally the photographer is asked to give his consent to such proceeding, but usually, we believe, this formality is dispensed with. The late Mr. Rejlander, Mr. Robinson, of Tunbridge Wells, and Mr. Valentine Blanchard, have all in turn been honoured with this delicate attention by engravers and publishers, who have simply taken what is generally called "French leave," and not troubled themselves about obtaining any other. Since, however, exhibitions of photographs have made their way, instances of this kind have been more rare, and the proprietors of illustrated publications have sought and obtained permission before they have appropriated the photographer's ideas and work. Mr. Robinson's "Preparing Flowers for Market," exhibited three years ago at the Pall Mall Gallery, was, we believe, the last picture that was engraved from our exhibitions, and that picture, it may be remembered, had the honour of a full page allotted to it in the *Illustrated London News*. On the present occasion—and this, we contend, speaks much in favour of the popularity of the Exhibition—no less than four pictures have been already secured by the *Pictorial World* for engraving, and the list is not yet complete. They are Mr. Pritchard's "Waiting to go on" (No. 126), which will probably appear this week; a study of Mr. Harry Pointer's "Cats" (221); a study by Messrs. Stillfried and Andersen, of Japan (365); and last, though not least, the medal picture of Mr. G. Nesbitt, "Tired Companions" (241). Had not the pictures of the war so entirely absorbed the pages of the *Graphic* and *Illustrated London News* at the present moment, both these journals would probably have chosen at least one representative picture from the 1877 Exhibition; indeed, it is not unlikely they may do so even now. In any case, however, as we have already pointed out, the tendency of illustrated journals to request permission to copy photographs is a good sign of the times.

Lithography and Photography.—A monument has just been put up in Munich to the memory of Senefelder, the inventor of lithographic printing. It is not, however, the first memorial in the birthplace of the ingenious printer, for we passed through a Senefelder Strut on the occasion of our last visit to the beautiful Bavarian capital. Senefelder, it will be remembered, perfected his process of printing about the beginning of the present century, and immediately took out patents for his method of printing in all the principal countries of Europe. It was only, one might almost say, in the vicinity of Munich that such an invention was possible, for the town is, singularly enough, in the vicinity of one of those rare districts where the porous stone proper to lithography is to be found. To this day a very large quantity of our litho stones come from the neighbourhood of Munich, and it is more than probable that Senefelder would never have been able to print from stone had he not, fortunately, possessed specimens of the particular kind of material that is adapted to the process. It was Senefelder's discovery which made early investigators in the matter of light-printing redouble

their efforts. Nicéphore Niepce and other less successful searchers after the philosopher's stone at once took up lithography, in the hope that they might be able to get light to paint its shadows upon stone, whence they could again be printed. The stone surface was washed and treated with all sorts of preparations, in order to entice shadows to leave some trace of themselves behind. Nicéphore Niepce, indeed, went so far as to put a stone surface at the back of his camera, filled with the idea that he might get an image impressed thereon. The fascinating discovery of Senefelder was tried again and again, and with what success we now know. But since photography has become an established fact, a sympathy has grown up between the two graphic arts, and now, indeed, a photo-mechanical printer who works with colloid films must, to be successful, have first of all served his apprenticeship as a lithographer. No one would be happier in knowing this than early photographic investigators, who, if they could rise from the dead, would infallibly assure us that they knew all along the two arts were related. Certainly they appear to be so at the present moment, and if ever photo-colloid printing comes into general use, as there seems every probability, the inseparability of the methods will hardly be believed in.

The Progress of Electric Lighting.—The office of the *Paris Figaro* is now illuminated by means of the electric light. It is surprising how slowly this valuable means of lighting is making way. Every now and then we hear of some new invention or other which is to place the electric light within the reach of all, and render it applicable to the purposes of every-day life; but, somehow or other, we get very little further. And yet electric illumination is not only the most vivid with which we are acquainted, but has, moreover, the advantage of requiring the expenditure of very little material in its production. The old method of producing the light by means of the voltaic pile, as Sir Humphrey Davy did in the year 1801, at the Royal Institute, has grown into disuse, and no one now-a-days would think of generating electricity for the purpose otherwise than by means of a magneto-electric machine. In our bigger lighthouses around the coast the electric light has been introduced with considerable success, and in all these establishments the electricity is "ground out," if one may use the expression, of powerful magnet machines set in motion by small steam-engines. In fact, the amount of electricity generated depends, in the main, upon the power of the steam-engine employed. In Paris, electric lighting is no longer a curiosity. At the *Louvre Magasins* the electric light has been in use for some time, as also at the *Chemin de Fer de Nord*, and some of the big factories at Paris. In this country the only example of electric lighting in a private factory is in the case of Messrs. Siemens Brothers, of Charlton, whose cable works are frequently lighted by the electric spark to enable their hands to work after dark.

THE SCIENCE OF PHOTO-CHEMISTRY.*

BY M. R. RADAU.

THE researches of Dr. Gardner, who has experimented with prismatic lights, give results agreeing rather with those made by Mr. Draper. In raising, in boxes exposed to different colours of the spectrum, seeds of turnips, radishes, peas, &c., Dr. Gardner found that the green colour of the leaves was developed extensively by the yellow rays. The shortest time that has sufficed to turn green a bed of forced turnips has been two hours in pure yellow light. A tint of green that the yellow rays produce in 3h. 30m. is created by orange rays in 4h. 30m.; by green in 6h.; while the blue rays do not, at the end of 16h., produce a tint half of the depth. Again, according to Dr. Gardner, the indigo rays produce an effect on the shoots or twigs. Young plants

on which a spectrum is thrown droop all towards a common axis parallel to the indigo rays; those which are exposed to the red, yellow, green, &c., incline to the side of this ray. When the experiment is sufficiently prolonged, a forcing frame presents the appearance of a field of corn laid by two opposite winds.

Messrs. Cloez and Gratiolet (1849) placed leaves of plants taken from marishes in water charged with carbonic acid, and then exposed them to solar rays passed through coloured glasses; the observation as to the analysis of the gas has shown that oxygen was disengaged with more energy under the yellow glass than under the red or blue glasses. The different glasses employed, considered according to effects produced, are in the following order:—Colourless ground glass, yellow, colourless transparent, red, green, blue. It is a curious thing that the ground glass always gives the best results.

A German botanist, Mr. J. Sachs, has attempted to measure the action that light produces on aquatic plants by counting the number of gas-bubbles disengaged by the blow of a branch that had been exposed to the sun in a solution of carbonic acid. M. Sachs has found that the orange light was almost as active as the white light, while blue light gave a disengagement twenty times less in comparison. But, as has already been remarked by Mr. Dehérain, this method of measuring cannot be carried out with any precision.

M. L. Caillabet, on his part, has found that green light cannot disengage oxygen; that it favours, moreover, the absorption of this gas—a result that does not at all agree with what we have learnt from other observers.

M. Prillieux has attempted to place the question on another footing by comparing the action that produces different colours to equal luminous intensity. On plunging bottles filled with leaves in closed cases of divers solutions equally transparent, this clever botanist discovered that all the colours gave the same quantity of gas. According, then, to M. Prillieux, the difference observed by the other experimenters is simply that the coloured rays employed by them were unequally luminous; but M. Prillieux has used M. Sachs' method for measuring the intensity of the disengagement, and his blue solution, very diluted, evidently passes for white light. M. Dehérain has carefully avoided these errors in measuring the quantity of gas disengaged by employing opaque solutions: they diffuse or concentrate the rays up to the moment. Where placed in a dark chamber, before a candle, they give shadows of equal density. Under these circumstances M. Dehérain has found that the action of different colours, even though they tend to the same degree of transparency, is very unequal; thus, in an experiment, twenty grammes of the leaves of *Potamogeton crispus* have given the following quantities of gas:—

LIGHT.

Orange	Red	Blue	Green
67c.c.	43c.c.	14c.c.	10c.c.

M. Dehérain concludes, from his experiments, that the most efficient rays are the yellow ones, thus agreeing with Mr. Draper. It is also the conclusion arrived at by Messrs. Pfeffer (1871) and Kraus (1876). Again, Messrs. Timiriasev (1869) and N. J. C. Muller (1872) have found the red rays to be the most active.

Now we know that the alcoholic solution of chlorophyll, which is of an emerald green, absorbs powerfully the medium red rays of the zone comprised between the rays B and C, then the orange rays bordering on D, certain yellow and green rays, and, finally, the violets. According to M. Muller the most active rays precisely correspond to the first absorptive layer of the chlorophyll (medium red) and a second maximum exists in the orange. According to the experiments of M. Wisner (1876) these same rays are particularly favourable to vegetable exhalation.

M. E. Lommel (1871) has already proclaimed superiority of red rays, founding it on the reciprocal action that ought to exist between the absorption of ray the chlorophyll and their chemical action. He brings forward, for this purpose, the fact that the green of leaves includes the extreme red, but not the medium—which is absorbed. This is the cause that foliage appears of a coral-red when looked at through a blue glass, which permits the extreme-red to pass, while it (the foliage) appears dark, or black, through a combination of glass which transmit but the medium-red rays. M. Lommel has verified this theory in raising some beds of be under coloured glass which transmitted the two shade red; in the extreme red the plants were drawn up stalky, and under the medium-red they shot forth vigour, though the light transmitted was very small. We may here remark, that according to Sir J. Herschel the green colour that is obtained from leaves alters materially under the influence of red rays.

The results seem to prove that certain colours have really a specific action on vegetation. Let it be added, that according to Messrs. Baudrimont and P. Bert, the white light is, in the aggregate, more effect than the different coloured lights; and this seems also to be the result of M. Eug. Marchand's observations on apparition of "the green matter of Priestly" in apricot water exposed to light.

To resume, the mode of action of light on plants is very imperfectly known; the question has still to be proved by more numerous and decisive experiments. It is necessary not only to study in detail the action of light produces on the different parts of living vegetation taken at divers periods of generation, and in different circumstances, but also the modifications that organisms in general undergo under the influence of different coloured rays. M. Niepce de Saint-Victor exposed to the sun some starch suspended in water charged with a little nitrate of uranium; the starch changed to sugar. The observation is, perhaps, fitted to throw a new light on the formation of sugar in fruits, and on the cause of the phenomenon of ripening. Many other actions, such as the alteration of vegetable fibre, on which the bleaching linen depends, enter into the same category. We find some very curious observations on the action of light in an article too little known, that Sir John Herschel published in 1842.* By continuing researches of this nature we shall attain, probably, to results very important touching the theory of chemical affinity.

Finally, we must not forget that the action of light on animal life varies also with the colour of the rays. M. Bécillard placed some eggs of the ordinary house-fly under bell-glasses of different colours, and showed that the maggots hatched in the violet or blue rays were more developed than those brought forth under the green rays. According to the same physiologist, the respiration of frogs is more active in the green rays than in the red, but this is contrary to what is observed if the frog is stripped of its skin. M. Guarinoni, Professor at Plaisance, believed to have proved a favourable influence of violet light on silk-worms. Thus we perceive that different colours produce on men and animals very different effects; but this is a subject that has, as yet, been very little studied.

COFFEE-GUM PROCESS.

BY A. BOURGON.

WHY do plates prepared with albumen produce negative hard, but very distinct; whilst those produced by the process in which gum plays an active part are more ray and soft?

Why do negatives obtained by tannin or resinous pro-

* "On the Action of the Rays of the Solar Spectrum on Vegetable Colours" (*Philos. Trans.* 1842).

Continued from page 544.

cesses, and developed with pyrogallio acid, present different tones?

We could easily answer, to these questions, that in the first case the difference is due to an acid or alkaline reaction, and in the second case that an analysis of the substances employed would give an explanation. These answers we will admit, but are bound to confess that it would be well to study more closely the chemical compositions and reactions of the substances we employ, as by this knowledge we could arrive more surely at the required results. By a series of experiments often repeated, it has been shown that the more coffee is roasted the more strength it yields; coffee little roasted gives negatives very weak, which, however, by judicious intensifying, can be made superior to those obtained by any of the other dry processes.

The mixture of gum and sugar with coffee offers the most valuable resources; these two agents add to the mixture qualities which help to establish its uniformity of action if the proportions are correct, for by diminishing the quantity of gum we lose rapidity and softness, and by increasing it one half we produce rising of the film and blisters.

It will be perceived that the margin allowed is large. The following proportions are those which I have adopted, and which have never failed:—

Solution No. 1.

In distilled water ...	600 cub. cents.
Dissolve gum arabic ...	35 grammes
Sugar candy ...	3 "

Solution No. 2.

Boiling distilled water ...	600 cub. cents.
Pour on	
Coffee well roasted and finely powdered ...	65 grammes
White sugar ...	30 "

Let this solution cool in a bottle well corked. After it is cool, filter each solution separately; then mix together; this will produce a dark brown mixture, which will keep fresh for a few days only; then pour into a test-tube of sufficient capacity (500 c.c. or so); coat with this solution of coffee gum your plate in the same manner as with collodion, without pouring it on from too high, as that infallibly produces bubbles; throw away this first solution, the object of which is to do away with all traces of water; then coat again as at first, pouring on a sufficient quantity to cover all the surface; work it about for some seconds, and then return the excess into the glass; let the plate then drain in the rack. Take glass number two, and submit it to the same operation, and so on till all your prepared plates have received this final coating.

When you judge the plates in the rack sufficiently drained, remove them to your drying box. Mine is a large box made of white wood, and fitted in a recess in my laboratory, capable of containing eighteen plates, 30 by 40 centimetres, 1.75 metres above the floor; the lid opens in front, and the plates on being removed from the rack are put face outwards, and they rest on several thicknesses of blotting paper, with which the box is lined at the bottom. In damp weather, or when the temperature is below 15° C., I aid their drying with a small fire. Generally my plates are dry in four hours. I then place them in their respective frames, first having assured myself that the prepared layer presents an aspect equally as brilliant as the glass itself; if otherwise, it is useless to put them into the frames, as the plates which, after drying, present a cloudy aspect, or show lines or "zones," have been badly washed, or have not dried regularly from top to bottom: with such glasses good results are not to be expected.

After all is said and done, it will perhaps appear that the preparation of these plates occupies much time; in frequently preparing them, I can safely say that ten minutes per plate is amply sufficient. We are, however, well repaid by the excellence of the results.

THE EXPOSURE.

With the coffee-gum process the necessary exposure is not more than three or four times longer than that necessary with the wet process, in the same light and with the same lens. However, it is as well to avoid too short exposures. It is better to rather over-expose, and we are more sure of securing beautiful results; they develop with more facility, and it is always better to moderate than to force. It appears to me, also, that it is better to take a view in a diffused light than in too strong sun-light. The contrasts are less violent, for the lights are less clear, and give shadows less dense.

THE DEVELOPMENT.

We generally feel a great impatience to return home as quickly as possible, to know the results given by the plates exposed.

Can the development be deferred to a later period? Yes, for I kept for six weeks some glasses which I had exposed and noted, without submitting them to the action of the developer. I found no difference in the development between these old plates and those recently exposed, which would not have been the case with plates submitted to other preparations; this I know for certain, from often repeated experiments.

The coffee-gum process can perfectly undergo alkaline development, which gives me such good results; but when we possess a developer which answers equally as well, if not better, it is as well to use it. That which I employ is composed as follows:—

Filtered rain water ...	1,000 c.c.
Pure sulphate of copper ...	40 gr.
Citric acid ...	40 "
Iron ammon. sulph. ...	40 "

I then proceed thus—

The plate having been exposed, it is then washed for several minutes under the tap in the laboratory, this operation freeing the plate of the coffee-gum solution, and rendering the layer of collodion penetrable. Into a sufficiently large developing glass pour some of the above solution, let it drip for some seconds, cover the glass with the developer, let it act for some instants, then pour into the developing glass some drops (two or three) of a solution containing—

Distilled water ...	100 c.c.
Nitrate of silver ...	3 gr.
Citric acid ...	3 "

Pour the liquid from the plate into the glass, mix well together, repour this out to the plate, and let it act for some seconds: if the exposure has been sufficient, the high lights will begin to appear. Keep on working the liquid on the plate, and renew it when it becomes muddy; continue renewing the mixture till your negative has acquired its requisite tone.

The image does not take long before it gradually completes itself; let it act until in the shadows you have obtained the most possible detail, which can never be too much, for the more perfect you would have a print, the more softness and harmony is requisite. When you judge that your negative is finished, or developed, and in spite of this it remains too soft (when the print would be too flat) wash the plate, as it is necessary to intensify with the following solution:—

Filtered rain water ...	1,000 c.c.
Pyrogallio acid ...	5 gr.
Citric acid ...	5 gr.

Pour on the plate, let it act for some instants, then put into the cup some drops of the silver solution (at 3 to 100) and continue to force until the negative has attained the degree of intensity requisite. It is necessary, however, to be very cautious with this manner of forcing, for in drying the negative comes up a great deal; it is preferable to renew this after drying and fixing, which I accomplish

with a saturated solution of hyposulphate of soda. Wash well, and let dry. If, after drying, the negative requires to be still more brought up, the operation can now be carried out in ordinary light, using a mixture of the pyrogallic and silver solutions as above. When the tone wished for is obtained, fix once more, wash thoroughly, dry, varnish, and proceed as ordinarily. The operations which follow must be left to the taste and the skill of the operator.

My task is now finished, and I trust that the operations which I have minutely described, although at some length, may not frighten intending operators. I wish that the generality of my confrères would adopt this process, which I am certain would produce satisfactory results.

A PROCESS OF REDUCING SILVER CHLORIDE TO THE METALLIC STATE.

PARTICULARLY SUITABLE TO AMATEURS.

BY J. W. LEIGH.*

MANY amateurs, I believe, trouble themselves very little about the reduction of photographic silver wastes, simply because they consider their small quantities not worth sending to a professional refiner, or that the process of reduction to the metallic state is troublesome, and not worth the expense. Now, the process I am about to describe is simple, effectual, and economical, and particularly suited to the amateur who has comparatively small quantities to operate upon.

As regards the precipitation of Ag Cl from solutions containing Ag NO₃, we, no doubt all of us, make use of the same salt, namely, Na Cl.

In my own dark room is a large inverted bell-glass, into which are poured the washing water of dry plates and paper prints, the rinsings of glasses, baths, and other vessels which have contained Ag NO₃ in solution; and, at the end of the season, all the nitrate baths are added to be precipitated as Ag Cl by the process just mentioned.

The precipitated chloride may now be well washed by decantation, dried, and weighed, or may be poured into the evaporating basin without washing. Add to the Ag Cl about its own weight of KO H, or Na OH, and half its weight of cane sugar, with sufficient water to well cover the whole, and boil for about fifteen minutes over a Bunsen's burner. This solution turns muddy on applying the heat, but in a few minutes gets somewhat clearer, owing to the reduction of the silver, which settles on the bottom of the basin in the form of a grey powder, lacking altogether the metallic lustre of silver cast into ingots or buttons. The finely-divided silver is transferred to a precipitating beaker and well washed by decantation. The clear washing water is now tested with Ag NO₃ until no precipitate is obtained; the silver is then washed in two changes of distilled water.

There is nothing new in the above process; it is based upon the fact that solutions of lucrose or dextrose, in the presence of alkalies, reduce the salts of the noble metals to the metallic state; the chlorine, in the case of chlorides, remaining in solution.

At the commencement I stated that this was an effectual method of reducing Ag Cl, which I think I can prove. From one precipitate I had 5,663 grains of dried Ag Cl, which, according to calculation, would yield 4,262 grains of pure silver. I actually got 4,250 grains, being a loss of twelve grains, possibly accounted for by the chloride having absorbed moisture between drying and weighing; or probably a small quantity of kaolin may have been mixed with the chloride. The process is also economical, Na OH costing about fourpence per pound, and sugar about threepence per half-pound, which is sufficient to reduce considerably more than one pound of Ag Cl to the metallic state, without the expense of building a furnace; also less the risk of a broken crucible, and, possibly, the trouble of collecting the precious metal from the remains

of a coke fire, for which, I know from experience, is anything but amusement.

Those who prefer a crucible can obtain sufficient heat on an ordinary blacksmith's hearth, with a small coal fire. After the silver is well washed, it is ready for dissolving in H₂WO₃, which is quickly effected, owing to the fine state of division of the silver, the excess of acid being readily liberated by addition of washed and dried Ag CO₃, until effervescence ceases. It is as well, however, to add an excess, as it settles on the bottom of the vessel, and is easily dissolved by a few drops of H NO₃. The process of liberating the acid was recommended by the Editors of the *British Journal* some time since. In my own practice, I do not take the trouble to crystallise the Ag NO₃, preferring to keep it in a very strong solution which is perfectly neutral so long as there is precipitate of Ag CO₃ on the bottom of the bottle. The strength is readily tested, either by the argentometer or, volumetrically, by a standard solution of Na Cl.

A NEW AUTOGRAPHIC PROCESS.

AUTOGRAPHY is a long-known process by which manuscript, or drawings, made on common paper by means of a peculiar kind of ink, may be transferred to a lithographic stone and then printed.

A new method, which is said to be both simple and cheap, is described by Professor G. O. Sars, of the University of Norway, in the *American Journal of Science and Arts*. The drawing is done on common letter paper, which, on one side (where the drawing is to be made), has been coated, by means of a sponge, with a thin film of starch. As it is not well for the shading to use quite glossy paper, it is a good way to give it a granulated surface by pressing it against a lithographic stone. By using for this purpose stones with more or less smooth surface, the paper will assume any degree of smoothness required, according to the character of the drawing. The next process is to fasten the paper to a sketching-board or a piece of pasteboard; the drawing is then made by means of the lithographic crayon.

The paper must be cut to the size intended for a full plate, and the drawings arranged in the same order as they will have to appear in the printed plate. The method is the same as in common drawing with lead pencil—or rather, crayon. The figures should, however, first be sketched in outline on common paper, and then transferred to the prepared paper in the usual manner, by means of transparent paper and plumbago paper, blue paper, or, still better, red paper, the transferring being done with a lead pencil that is not too soft. The details of the figures, the shading and finer structural conditions, may be drawn off-hand with the crayon on the prepared paper, after the outline has been transferred. Any correction or change in the drawing can easily be done by erasing with a fine scalpel, taking care only that the starch film be not injured. When the plate is finished to satisfaction, it is transferred to a common smooth lithographic stone, in the following simple way: The back of the paper is moistened with water containing a small portion of nitric acid; and after having been put for some time between moistened soft printing paper, the plate is laid, face downward, on the stone, which then for a moment is put in the press. To make more sure of it the outside of the paper may be slightly rubbed with the finger; if, then, the paper be stripped off, the drawing and the entire film of starch will remain on the stone, the figures being reversed. Now the stone is to be treated in the common way with gum-arabic and a weak etching, and will then be ready for printing. The whole process of transferring the drawing from the paper to the stone is simple, but requires practice and great care. This should, therefore, be left to the charge of a professional lithographer. This process is especially well adapted to the uses of zoologists, microscopists, and naturalists generally, as it enables them to prepare their own illustrated plates at minimum expense.—*Scientific American*.

* Read before the Manchester Photographic Society.

THE PHOTOGRAPHIC EXHIBITION.

From the MIRROR OF LITERATURE.

THE gentlest of arts, Photography, receives each year new developments and takes higher aims. A visit to the charming exhibition of the Photographic Society at 5A, Pall Mall East, will surprise any but the most apathetic by the ability of the workers, whose cunning devices compel the great centre of our universe to fix upon a tender film the most beautiful of animate and inanimate creations.

We were able last week to notice a very few of the portrait illustrations. Let us now turn to the compositions and character subjects. None of them are more conspicuous than the cottage interior (281) by Mr. H. P. Robinson, of Tunbridge Wells, who has long been eminent in this branch of the art. The title is "When the day's work is done." The characters are an aged peasant man and woman, the former reading from the best of books, while the latter plies the needle. They are surrounded by appropriate objects of still life well disposed, and the well-conceived and happily-executed production—said to be "from Nature"—is one of the leading features of the collection. "Birdnesting," by A. Ford Smith, of Llandudno, shows three handsome young ladies searching for their prey among the foreground ferns of a well-composed landscape. The artist is to be congratulated on his subjects, if this be a portrait group, no less than they upon his service. Another ornament of the gallery is "Tired Companions," by G. Nesbitt, of Bournemouth, a copious exhibitor. The characters here are delightful—a little girl using a noble mastiff for her pillow after a glorious romp. From Lincoln we have a study of a beauty in book muslin contemplating the "they wavelets rippling to the shore," and called "Alone." She should not long be so. "The Taxidermist," surrounded by his handiwork and properties, and an angler in leafy nook, with all the trappings of that gentle art about him, attest the skill of Mr. S. Fry; nor will Mr. W. Cobb's achievements in the same direction fail to attract notice. The honorary secretary of the society, too—Mr. H. Baden Pritchard, of the Royal Arsenal, Woolwich—exhibits a very clever and genuinely comic study of this order, called "Waiting to go on" (No 128). The picnic groups and military subjects of Mr. Robert Crawshaw, another distinguished amateur, also evince as well that gentleman's affection for the art as his proficiency. "Cross Purposes" between a young married couple (472) is the one amusing contribution of Mr. Edwin Cocking, and here we must leave the *genre* subjects.

In our last we referred to one or two of the most commanding portraits, but very naturally omitted others of peculiar attractiveness. Mr. Nesbitt's "I'm sure he'll come," the title of which explains itself, all but speaks. The same artist's "Lizzie" and "Eliza" are marvels of art-work on Nature's ground. The same may be said of the beautiful child (362) by Faulkner and Co., and of the delightful combination of Crayon Photography in portraiture from the studio of Mr. G. Piercy, jun. (520 and 521); while Muschewski's magnificent "Portrait of a Lady," taken direct (397), seems, as it were, almost a *plus ultra* of fashionable portraiture. But attention cannot fail to be claimed by the fine work of Herr Tasschler, and the marvellous combination of the etching needle with the photographic film shown by F. Gutekunst (No. 526). Here we have an employment of photography as a base for other workmanship. The process we have not room to go into; but the result, as exhibited, is most interesting.

Here we must part from portraits, although a page or two would hardly suffice for an enumeration of the presentments of youth and beauty emanating from the artistical laboratories of all civilized lands.

A paragraph is now due to the landscape division, to which the same excuse is due for too brief notice. From the Autotype Company we have grand specimens of carbon enlargements, after negatives taken by Vernon Heath in Glen Shiere (58), and by J. R. Sawyer under the towers of Windsor (5). The same firm send specimens of landscapes printed in permanent pigments, of photographs from the printing press, and copies from paintings—a varied and useful series. The Swiss views of W. England, which occur very early in the catalogue, cannot fail to charm the spectator. "The Road to Grindelwald" (34) is particularly tender. The works of the Royal Engineers' School of Photography, souvenirs, as they are for the most part, of delicious Surrey landscapes, are no less fascinating than that of Captain Varney and Lieutenant Darwin, who draw inspira-

tion from the same county and from Kent. The "Mont St Michel" of Mr. Stephen Thompson (42) is one of the most striking "bits" in the gallery. The rustic studies of J. Milman Brown, F. Hollyer, T. Annan, and J. Protheroe have all charms for the admirer of the woodland, mill, or farm, or common. Reuben Mitchell has brought a fine study of cloud, rock and torrent from Skye; and T. B. Hutton is more successful in his "Breaking Wave from Sark" than has fallen to the lot of Colonel Wortley, whose forte is in selecting and seizing on masses of cloud.

Before closing, we may perform a hardly necessary task in noting the wonderful cat and dog arrangements contributed by Messrs. Pointer, Nesbitt, and Hedges. They are so conspicuous as to need no introduction. Not so the three interesting and unobtrusive "Heliographs" (420-422) contributed by the Engineers, and well worth attention. "The Fisherman's Cottage" of this series is a charming specimen. In conclusion, acknowledgment is due to the Autotype Company for the facsimiles of illuminative drawings as old as A.D. 700; and to the Lords of the Admiralty and Mr. W. J. A. Grant for the long and interesting series of Arctic views from negatives taken by the late Expedition.

CHROMO-PHOTOGRAPHY.*

PREPARATION OF COLOURED PHOTOGRAPHS UPON CONVEX GLASSES.

Preparation of the Tragacanth Mixture.—Into a little metal cup is put some gum tragacanth, and over the latter is poured some hot water; further water in a boiling condition is then added until the solution is sufficiently dilute.

Mounting of the Pictures.—Ordinary paper prints are employed. If the photograph is already mounted upon cardboard, it is dipped in water and allowed to remain until the paste or other cementing material has become moist. Then the print is carefully removed from the cardboard, without injuring it, and the cement removed from the back; the print is then cut rather smaller than the convex glass, and put between sheets of filter paper until it is nearly dry. Unmounted prints are cut to the proper size, and then moistened.

The front of the picture is now coated with tragacanth solution, as also the inside of the convex glass, which has previously been cleaned with ammonia. The print is placed face downwards upon the glass, the air-bubbles removed by the operators' fingers, and the superfluous tragacanth solution pressed out. Then a stout bit of paper is placed over the print, and the latter rubbed well with an ivory or bone folder, care being of course taken not to break the glass.

Making the Picture Transparent.—The wax or other transparent material is put into a metal vessel, and the latter placed in hot water which is over the fire. When the material is perfectly wetted, the mounted photograph is put in bodily until it has become quite transparent; this may take half an hour. The picture is then removed, and all extraneous matter removed with the fingers or with a hard brush.

The Painting.—Eyes: blue—ultramarine with a little ivory black; brows—Vandyke brown; grey—ultramarine, Vandyke brown, and silver white.

Flesh: vermilion—silverwhite and Naples yellow; in the case of children, carmine is taken instead of vermilion; for bronzed faces, a little Vandyke brown is added.

Hair: blond—chrome yellow and burnt sienna; brown—Vandyke brown; black—ivory black and ultramarine.

The painting is done on the back of the picture; the eyes, the white of the eyes, the lips, ornaments, and all parts which have sharp outlines, are first painted; then a narrow strip of cardboard is cemented at top and bottom of the glass, and a second convex glass put into the first; upon this second glass the hair, the flesh tints, garments, background, &c., are painted.

The pigments may be mixed with a little magillp. When finished, a piece of cardboard is put at the back, and the whole cemented together with rubber paper. The whole is then put into a suitable frame.

* Photographic Photographer.

The Photographic News.

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THE YEAR-BOOK OF PHOTOGRAPHY FOR 1878.

Our annual for the forthcoming year is now in course of preparation, and will be ready by the end of the present year. As our readers know, one especial feature we have established in connection with our own record of the year's photographic progress is the publication of the experiences of many able men; and we now appeal to our extensive body of experimental and practical readers for brief records of any interesting facts coming within their own experience and observation. We shall be greatly obliged by brief papers of this kind from as many of our readers as possible, and our gratification will be greatly increased if they will favour us with early copy. We may here also appeal to our numerous advertising friends to favour us with early copy of their announcements, that the publication of the Year-Book may not be delayed.

PHOTOGRAPHS OF ANIMALS.

It is a fact familiar to many photographers that photographs of animals and photographs of babies always afford pleasure to cultivated and artistic observers, where a collection of portraits of men and women fail to interest. The reason we once heard explained by an eminent artist, and it is obviously the true one. He remarked: "In the photograph of an animal, and in the photograph of a baby, there is no affectation, no self-consciousness, no preparedness of expression and general effect—qualities which often make the portraits of men and women uninteresting, and, at times, odious and offensive. In the photograph of the animal, and alike of the baby, there is simple nature unsophisticated by considerations of effect, and the true pictorial representation, even if not beautiful, is always interesting and satisfying." This is doubtless true. But the circumstances which give these pictures value are material elements in the difficulty of producing them. The preparedness to sit of a man makes him, as a rule, at least endeavour to help the artist by remaining still during the prescribed number of seconds, whilst dog, or horse, or cow, or bird, or babe, if it has by chance been still enough to permit the photographer to secure a focus, is the more likely to move immediately afterwards, and spoil the exposure!

The late Photographic Exhibition was unusually rich in photographs of animals of great excellence. We have received many letters of protest and surprise arising out of the fact that whilst a medal had been offered for the best photographs of animals, no medal was awarded; and the implication follows, from the terms of the circular announcing the medals and conditions, that the jury were of opinion that no pictures of sufficient merit were exhibited

in the classes from the medals were withheld. On occasion the constitution of the jury was different from former jury appointed by the Society. As a rule jurors have been selected from the members of Council, the fair assumption having been that gentlemen were elected by the Society to conduct business, they were presumably the fit persons to jury to distribute medals to meritorious competitors; award of medals ever yet was made, however, gave universal satisfaction and raised up no grudge. Favouritism and personal influence were invariably charged as controlling the awards. A change in the constitution of the jury was therefore proposed, practices propitiate popular feeling, and two of the most accomplished artists amongst the non-official members of Society, and two painters, Royal Academicians, asked to join certain members of the Council to form jury and award the medals. This was done, and awards ought to be beyond cavil. They have not, ever, given universal satisfaction. In several cases medals they have awarded are alleged to be to pictures manifestly inferior to others in the Exhibition were passed by, and in many cases they have omitted to award medals at all, notwithstanding that worthy pictures were sent to compete for the non-awarded medals. Have no intention of discussing the question. In the case of this kind there is legitimate room for variation of opinion, and we are bound to respect the decisions of capable and high-minded men undertaking a difficult and thankless task. The discontent shows how impossible it is to satisfy the varied opinions and interests concerned in the matter. Without going into the general question, may admit that if the decision had rested with us—we happily did not—we should not have withheld the medals for animals, and so have constructively said that competing pictures were deficient in merit. But we here suggest that the withholding of this medal may have another construction, which is, most probably, the true one. The jury have not made any report, for which we are in the main, we think, to be commended. An old experienced judge, advising a younger man just about assuming judicial duties, said:—"Give your decisions freely but be careful to avoid giving the reasons which have to your decision." The jury have made their awards, have refrained from giving reasons. In this they are wise. Nevertheless, in such a case a report from the jurors would have been most interesting—indeed, few documents we have been more interesting than such a report from John Gilbert, R.A. It is very probable, we think, that it would have been found that the medal for animals was not withheld because of insufficient merit in the competing pictures, but because of the plethora of merit, and its equal distribution! Never have we seen so fine a collection of photographs of animals exhibited, and comprising so many fine examples of difficult subjects successfully managed. From the charming little bits of genre of Mr. Ayres and Mr. Vaughan both including skilful photography of animal life, to more extended efforts of Mr. D. Hedges amongst dogs, horses, and the marvellous renderings of ducks, fowls, &c. the pictures of animals are all good. Mr. D. Hedges has been for many years a successful worker in this direction and on various occasions has received medals for his work, and his contributions are more numerous, and less excellent, than ever. It is difficult, indeed, to imagine how his portraits of horses and dogs could be better. Mr. Nesbitt also exhibits portraits of dogs, with all singular delicacy and force which distinguish his portraits of mankind. Mr. Stuart's portrait of the grand mastiff of Dr. Huggins is a noble photograph of animal life. Perhaps the most marvellous examples in the direction are the groups of prize fowl exhibited by Mr. S. Glen Payne, of Aylesbury. These were pictures of large size, with the figures in fine proportions: texture and plumage perfectly rendered, and the groups

and posing so excellent, that we might readily imagine pride of race had induced the birds to lend themselves *con amore* to the purposes of the artist. The difficulties in securing satisfactory photographs of animals are immense. All the chemicals and preparations must perforce be in the best condition for instantaneous photography; and an enormous amount of skill, tact, and patience must be brought to bear in this work. We hope to induce some of the gentlemen to tell the readers of our YEAR-BOOK for next year something of the special methods involved in carrying such work to a successful issue. And we may, in conclusion, assure them, if any of them are disappointed in not receiving a medal, that the appreciation of the discriminating public is, after all, the highest meed of honour an exhibitor can obtain.

THAT PLAGUE AGAIN.

BY FOCUS, JUN.

WE have, during the last season, experienced a good amount of trouble from an inundation of spots of most prolific propensities, varying in size and appearing at irregular intervals. I am inclined to think they claim kindred with those that formed the subject of considerable discussion in the pages of the NEWS some time ago, and were decided as, in many cases, attributable to bronze attached to the mounting cards. I consider this conclusion of mine warrantable from the fact that many cartes finished in the same tonings as those spotted were perfectly clear; yet, for reasons which I will hereafter explain, it is not unreasonable to believe that on them similar signs may shortly become visible. If this be really the case, might not our "friends in distress" be troubled to the latter extent only—the spots being, as it were, in a dormant state, while ours is the same enemy in an aggravated form? I do not know if it is an old trail on which I'm scouting, but I will briefly narrate my researches; and should they contribute to the more peaceful slumbers of any poor, benighted disciple of the "black art," I shall feel happy.

When these visitors first made their bow to me, with beaming and sparkling appearance, I did not greet them with that spirit of hospitality suggestive of a pure descent from the ancient Briton; but, on "murderous deeds intent," began to consider from whence they hailed, and how most effectively to dispose of them. From experience, as well as from an able article by a fellow-townsmen that appeared in the pages of the NEWS last year, I concluded that lime was the progenitor of these gentlemen, more especially when, on searching, I discovered that a piece of limestone had, by some means, taken up its abode under the printing counter, and, in the fulness of its heart, had burst.

I, of course, carefully removed all traces, tried a few experimental prints, and found a considerable number of the extensive family had "taken up their beds and walked," leaving only a few of the strongest yet to cope with. Then, flushed with victory, I industriously covered the ceiling with brown paper, and scrutinized each corner of the room with an amount of determination that augured ill for the continued concealment of the smallest speck of our supposed enemy. By that strange fatality which so often distinguishes Dame Chance's dealings with our poor fraternity, another batch of proofs finished satisfactorily, thus thoroughly confirming previously-conceived opinions; and so, for some time, the prints continued. Already had I listened with deference to a lecture from my principal, pointing out the advantages of a perfect knowledge and control over all chemicals employed, and drawing attention to the speedy manner this difficulty had been removed by that means. The morals were doubtless good, and would probably have been attended with excellent results but for the inopportune reappearance of our star-like acquaintances. On they came increasing, like an advancing army, and also, like those hosts, raising a "pretty considerable dust," for

the governor took on badly with his precepts being thus upset. It was in vain that we endeavoured to arrest their progress; they became, in some cases, so thick that I had a notion of putting them to profitable use.

My idea was to find some manner of with certainty producing an air-bubble on each carte piece of silvered paper then exposing without any negative until pretty dark. The blotch would make an excellent "Luna on her silent course," and our particular friends of the "plague species" are capable of producing the most star-like effect conceivable; and so we have a cheap and perfect delineation of the midnight firmament. Nor need we languish in search of a name for this "combination" picture: "Nocturnal studies" would do, and if some inquisitive person peered too deeply into its composition, why it leaves one room to explain that it is only a *souvenir* of the many "stilly nights" dedicated, when under the bed-clothes, to the discovery of this new "planetary system." Strange to say, I have ceased to entertain the thought of patenting this discovery. So should any one perceive a fortune lies in it, I have no objection to forward further particulars for a small "consideration;" nor will I expect any share of the independency thereby achieved. Generosity was ever one of my characteristics.

However, to the point. I was fain to accept as a fact that lime, in at least its primitive state, was not the source of our troubles, so turned attention to the albumenized paper; but as I was using several samples of that article, I expected and found nothing wrong there. Next, as these promoters of activity did not appear until an hour or so after fixation, it was only reasonable to suspect that the tap water in which they were washed had something to answer for, especially when I remembered that the company managing that solution in Newcastle bear a reputation the envy of all the liquid manure manufacturers of the neighbourhood. But I found, with regret, that prints finished in the presence of rainwater alone bore precisely the same results.

The vessels containing the toning solution were wrongfully censured, and a crack discovered in the porcelain lining of a pan used for making that bath was prematurely hailed as the delinquent. Of course the silver and hypo baths were each subjected to our supervision at an early part of the proceedings, but without success; and yet it was in the combination of these two solutions that I eventually discovered the adversary.

And thus it was. I owned—or rather did once—as assistant printer, a youth of decided and advanced opinions, who evidently, in the superior organism of his brain, considered there was much of the red tape character about photography, and, among the many improvements to be effected, he had determined on dispensing with filtration in connection with the printing bath. Now we keep our silver neutral with carb. soda, which, of course, forms a precipitate of carb. silver at the bottom of the bottle, and this we retain there by first pouring off the clear solution, and then filtering it. The latter process, however, our go-ahead gentleman thoroughly discarded whenever the relaxation of our supervision permitted. Thus, it is easy to conceive that on simple decantation, and by such a hand, the carb. silver frequently introduced itself into the sensitizing trough, and the imagination goes little further to understand that particles become readily attached to the paper when silvering. Here we have the root of the evil, and, let me add, a direct confirmation to the value of a principle so frequently advocated by our worthy Editor, namely, to retain a full complement of bath, for we discovered that whenever the solutions was lowest there had we the greatest influx of spots. They are then in a latent state, certainly, and so will remain if subjected to only a weak hypo bath, but for what length of time I cannot yet determine. It requires a concentrated fixing solution to make them at once visible, and in this our ingenious youth did not fail us, for, with a worthy adhesion to his prin-

ciples, he preferred the rule-of-thumb to the monotony of a prescribed measure for mixing that soda, thus giving us a varied strength—to what extent the saints alone can tell! I need scarcely observe that the service of this energetic assistant is a thing of the past.

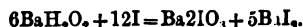
The number of miscalculations I have lately made has simmered so much of the cock-sure confidence out of my attenuated self, that I feel timorous about definitely attributing even this reason as the source from whence our toils arose, although subsequent experiments have proved to me that we can, like magicians of old, at pleasure recall the "spirit of the departed." Still, I am of opinion, that "the ills that photographers are heir to," in many cases, resemble foes of the human species. They espy us from afar, and should we be fortunately fully-equipped in the armour of knowledge, they, like the priests of "Good Samaritan" notoriety, take another direction, and, in short, *avoid an encounter*. But woe betide if their victim be at any point only weakly guarded, for they pounce upon him with spider-like pertinacity, and—well what follows I think I have sufficiently described. And I have enough presumption left to recommend my readers, who have got so far and are still awake, on the appearance of any symptoms of distress that appear to own relationship with mine, to immediately become personally interested in the phrenological development of their assistant printer.

IODIDES AND IODATES.

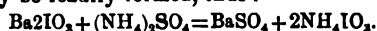
BY WILLIAM STEVENSON.*

The following process is recommended for making iodic acid, hydriodic acid, and most iodides and iodates:—

Dissolve two parts of baric hydrate in four parts of boiling water; add gradually three parts of iodine, and filter when the solution is neutral and colourless. The reaction is as follows:—



The precipitated iodate of baryta may be used for iodic acid by decomposing with sulphuric acid, filtering, and evaporating the filtrate to crystallisation *in vacuo*. By substituting an equivalent of any soluble sulphate the iodate may be readily formed, thus:—



The same applies to the filtrate containing the iodide of barium, which may be employed for hydriodic acid by adding sulphuric acid till no further precipitate occurs; or by decomposing with any soluble sulphate the corresponding iodide may be made:—



Correspondence.

CERAMIC PHOTOGRAPHY AND ITS PATENTEES; OR, A FEW HOURS SPENT IN THE SANCTUM OF AN ENAMELLER.

SIR,—I was not altogether pleased with the letter of your correspondent "Enamel" on the 19th. Perhaps there is some truth in the remark that ceramic literature is somewhat meagre; but I don't think that the next paragraph is altogether correct.

Your correspondent, referring to a specification recently published in your columns, insinuates that there is something tantamount to concealment of the actual process patented, and I think the Editor somewhat shares the same opinion.†

As one who has devoted considerable time to experimental photography, I can discover little ambiguity in the above

specification, and I have gone over it pretty carefully. It is not within my lines, however, to practically test it; but some few months ago I had the very great gratification of seeing Mr. Henderson go through the whole operations, and, what is of more importance to your readers, in answer to a question, "Was it understood that everything I had heard or seen in that enamel *sanctum sanctorum* was to be kept a dead secret?" Mr. Henderson at once said, "No; proclaim from the house-tops all that you have seen, if you like!" so that whatever may follow, I will not be accused of telling tales out of school.

In sauntering over the High Holborn Viaduct, I met with an old friend just arrived from the northern capital; he asked me to accompany him to London Bridge; a friend of his—a photographic enameller—would be glad to shake hands with me if he had time. I very readily embraced the opportunity, and after a smart walk we found ourselves in the photographic gallery of A. L. Henderson. My friend's card was sent in, and a stentorian voice came back, "Come up, old boy!" In going up that stair the thought never crossed my mind that we were to get into the sacred laboratory where these wonderfully beautiful enamels were manufactured; but the sequel will prove that we did.

On the first landing, and on the right hand side, was a door which was pointed out as the room where our enamel artist friend was engaged. The door itself looked peculiar—its face had evidently not been washed for many mornings. There was a huge key in the door, and about a dozen others hanging from it, giving one the feeling that once within its portals, if anything disagreeable occurred, it might not be so easy getting out. The door was opened, and we proceeded as far as the square of the open door; but I saw at once that to proceed further it would require a little mathematical calculation. Right before us stood, with his back towards us, a great, tall, muscular figure like Ajax, a head resting on great broad shoulders, bringing to vivid remembrance the bust of one of the old Roman emperors. He was too busily engaged to observe our entrance, having some of his chemical solutions coming up to a particular centigrade. On his right hand was a large, flat-bottomed flask, surging and bubbling over an enormous Bunsen burner; on his left were stoppered nickel retorts distilling over some oily and dreadfully odoriferous substance. At our feet, and on every side, was presented a scene of confusion and combination of things such as I have never seen. Right before us was a huge grindstone, serrated, carved, and grooved in a most extraordinary manner. On its frame-ledge were all sizes of enamels, evidently lying to be ground down to fit the various settings; bottles below, and bottles above, bottles on the floor, bottles everywhere. Peeping behind the door there was, suspended by a great iron chain, a huge pair of wooden scales. The chain seemed to be part of the hawser of the *Royal George*. Oh my! to see the rust festooned in and out of the links of that chain, as if it had been subjected to some terribly corroding elements since the Flood.

We were at last heartily welcomed, and proceeded with cautious steps until we reached the inner of the inner rooms. This presented very much the appearance of all that we had passed; there was certainly a little floor room, but no appearance of anything in the shape of a chair. There was something that could be substituted for that purpose; but certainly one would have left a concave matrix of the physical part that came in contact with it, at once proclaiming that this was not the place for gossiping loungers.

Just at the time there were in preparation a number of transparencies, both from direct and copied negatives belonging to the First Lady of the realm. Some of the prints from which they had been taken indicated they had had a hard tussel to get through the hypo malady. The arrangements for taking the transparencies were simple, but very effective, and were all vignettes. This was obtained very easily by the pendulum vignetter. This is a vignetting disc attached to a rod which moves to and fro betwixt the lens and the negative. Outside of the window was a

* *Chemical News.*

† The specification referred to appeared to us—whether from a desire for concealment, or from there being really nothing to conceal, we cannot say—to be wanting in perspicuity and plain statement.—Ed.

reflector made of silver corrugated glass; the bars lying horizontally, the light passed through obscure glass. The exposure was very short, developed with weak solution of proto-sulphate of iron, saturated with sulphate of alumina. There seemed to be great care taken in the washing, both before and after fixing, which was done in a solution of cyanide of potassium. The film now presented a very fine delicately graduated transparency, after being subjected to a solution of iodine, about the colour of a pretty deep sherry, again subjected to a thorough washing, it was now ready to be placed in the substitutional or toning bath. The action here was very rapid. A great number of these films were placed each in a small tray, in at least half an inch deep of the toning compound. The trays were now all placed upon that wonderful wooden scale. The ordinary brass kitchen jack was wound up. In an instant round went whirling the suspended scale, trays, and their valuable contents. The films were not long in showing that the baths were very acid, as each one came gliding off one after the other. Great importance seemed to be attached to keeping the films in quiet constant motion. After about three hours the whole of the films had sufficient of the substitutional metal deposited. They were all taken, repeatedly washed and re-washed; the enamel tablets were now taken, and gently slipped in below each film, and by a dexterous turn of the wrist each tablet had its picture beautifully centred without a single air-bell. They were then placed upon a looped piece of wire, resting on a small piece of blotting-paper. A jet of gas played for a few seconds underneath, which dried them. Any little detachment of film that had got over on the back was now carefully cleared off. We now accompanied our friend with a tray full of these to the lower regions, and there we saw a pretty large gas furnace that had been previously lighted, just beginning to glow into a white heat. Each enamel was fired upon a little disc of fireclay; this took not more than a minute to a minute and a half. They came out clear and brilliant. A little moist enamel colour was at hand, a small pencil was dipped in the colour, name and date were then imprinted. Each enamel had again to be placed in the furnace, but only for a few seconds, as the enamel colour fused at a much lower temperature than the original picture. Each of them was subjected to a little circular friction in the palm of the hand, with a little bath powder, which increased their brilliancy. There was not a single hitch in the whole of the operations. Every enamel, I believe, would be sent off to its destination that night. This ended one of the most pleasant, and certainly most instructive, photographic experiences I have ever enjoyed.

The ease, certainty, and rapidity with which the whole operation of enamelling was gone through, demonstrated that in the hands of the patentee his process was perfect.

With a long and an anxious wish for your French Correspondent's reply to that part of his letter of which I have taken no notice,—I am yours truly, A. S. B.

IMPROVED NEGATIVE RETOUCHING.

SIR,—While feeling greatly interested in Mr. F. E. Pearsall's "Improved Negative Retouching" which your last week's issue contained, I cannot but express myself disappointed with the results.

The transparent nature of the collodion film when placed in contact with the negative at once prohibits its application to gas-light work, which is undoubtedly an essential. It certainly, as is claimed for it, subdues the solar light considerably—as, in fact, any other coloured glass would; but is the reduction advisable? It truly is pleasant to admire the harmonious blending of each touch one applies in this light; but it seems to me as only a child-like way of cozening ourselves, for examination of the negative without the medium immediately dissipates the delusion, and invariably discloses to us a multiplicity of coarse marks and inequalities. Or, if the manipulator is with practice qualified to produce fine work amid these difficulties, it is at the

expense of such a strain on the eye-sight that I question if the glare of the pure sky is more hurtful. I do not advocate positive light—in fact, I write more in a spirit of inquiry than assertion. I at present prefer a light transmitted through ground glass on to a mirror, and from thence reflected to the negative, for both sky and gas-light work; or a piece of thin opal glass, on Mr. Pearsall's plan, I find to answer well for day-light, though rather too opaque for night work.

I am of opinion that, avoiding a glare, the stronger the light the better; yet, as curtailment is so universally adopted, there are probably virtues in it that I am not cognisant of. Hoping, if such be the case, soon to be corrected, I remain, yours truly, Focus Jun.

Newcastle-on-Tyne, November 21st.

THE SOUTH LONDON SOCIETY.

DEAR SIR,—It must have been highly gratifying to the gentlemen who promoted the Technical Meeting of the South London Photographic Society to have seen such a number of gentlemen (and even a few ladies) respond to their invitation to come and benefit by the experiences and inventions of their brother "photos.;" but I could not help wondering, while looking round on the crowded room, why many of the London professional and amateur photographers present did not become members of the Society.

The subscription is small (10s. 6d. per annum), and, as an old member, I can assure them our meetings are of the most enjoyable kind. Nothing is deemed of too small importance to be brought forward, though we are often favoured with papers by gentlemen of the highest position in the photographic world (as they must be aware from your reports of our meetings). The discussions generally assume a most pleasant, conversational form, and I should much like to see our ranks strengthened, as I feel sure that the more photographers meet in a social manner to discuss the various branches of their profession, the sooner will the little jealousies and prejudices disappear that are so often prevalent among them.

Our secretary (Mr. Edwin Cocking) will, I have no doubt, be glad to receive the names of any ladies and gentlemen willing to become members; and I trust the minutes of our next meeting will show, at any rate, as good a list of proposed new members as some other societies mentioned in your last week's impression—Yours faithfully, F. A. BRIDGE.

9, Norfolk Road, Dalston Lane, London.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Technical Meeting.

The Annual Technical Meeting of this Society was held in the large hall of the Society of Arts on the evening of Thursday, November 15th, Mr. P. LE NEVE FOSTER presiding.

The CHAIRMAN read the notice convening the meeting, and asking photographers to contribute technical novelties of any kind which might be interesting.

Mr. HUGHES briefly explained the history and purpose of the technical meeting, the aim being to afford opportunity for an inspection of various appliances not easily seen without much trouble. Inventors, and patentees, and manufacturers were all invited to exhibit their products, and explain them; but, as a rule, beyond questions for necessary explanation, discussion was not desirable, as it would take up too much time, and exclude many interesting things from attention.

Mr. BOLAS exhibited the scenograph of Signor Bardelli, of Turin. It consisted of a small folding camera, with flexible body, easily expanded, and made rigid with loops of wire which fitted into grooves made to receive them. The stand, which when packed formed one round stick, could be expanded into a tripod, the pieces being jointed together, and were not detachable.

originally; and, so great were now the resources of photography he was not sure that the photographer (whose task as to models was as difficult, or more so, than that of the painter or sculptor) might not in time do something of the same kind by the joining of negatives. As far as fine art photography was concerned, England certainly took a high place, and none had done more to raise the tone of the art in this direction than the late Mr. Rejlander, in whose works there was a poetic and imaginative feeling and treatment which quite lifted them out of the rank of mere mechanical productions. In coupling with the toast the name of Mr. Valentine Blanchard, he was sure that all present would be agreed there was no one more worthy to respond to it. (Hear, hear.)

Mr. BLANCHARD expressed his thanks for the honour which had been done him, and he did so with the more sincerity remembering the many pleasant gatherings when one who still lived in their memory, far more worthy than himself, responded to this toast. He well remembered the formation of the South London Photographic Society—since the idea was first started in a conversation he had in his own house with Mr. A. H. Wall. From the small beginning the Society had gradually advanced, and he could look back with pleasure and pride to its many successful and profitable meetings. In those days the Society used to pride itself upon the encouragement it gave to art, and for himself he was strongly of opinion that it was the duty of every one engaged in photography to do what he could to make it an art, not to deal merely with the camera as a blind instrument, but rather to make it the intelligent medium of embodying some idea or form of beauty. Photographers had one advantage over painters and sculptors, that it was not necessary for them to devote long years of toil in order to train the hand; photography could be learnt in a dozen lessons, and all that was necessary for the photographer to acquire was to see nature as a painter saw it. On the other hand, the portrait painter had advantages which were, and perhaps must ever be, denied to the photographer. The painter was invited down to the mansion of his siter, could take his own time as to work, could have every opportunity to study face and individuality so as to represent them in the most favourable aspect; but the photographer was obliged to do the best he could with limited time and surroundings, circumstances which might be favourable or not. He could not study a sitter at his leisure, but had to seize upon the salient points and make the best of them. At the same time, it was impossible not to see that the artist of the present day was greatly indebted to photography. It was a singular fact that the rage for pre-Raphaelitism which did so much to revolutionize the world of painting came in with the advent of photography, and it was a fair assumption to say the old courtly painters such as Laurence and Vandyke, great as they were, would have been still greater had they lived in an age when photography would have forced them to be truthful. (Applause.)

The CHAIRMAN then proposed "Commercial Photography," to which Mr. Mawdsley replied.

The toast of "The Press" followed, coupled with the names of Mr. G. Wharton Simpson, Mr. William Sawyer, Mr. T. Archer, and Mr. Charles Pearce.

Mr. SIMPSON, in reply, said that by a singular coincidence the employees in the printing office of the PHOTOGRAPHIC NEWS had that week congratulated him on the fact that the paper had reached its thousandth number. He could not help thinking that the success of the photographic journals—and they had been successful—was due to the intelligence of photographers, for without this the journals could not have existed. A photographic journal was rather a record of effort and experience on the part of photographers themselves, than an organ of any individual opinion or guidance. Undoubtedly, photography owed much to the printing press, for without it the dissemination and registration of facts discovered would have been impossible. In conclusion, Mr. Simpson referred to Mr. J. T. Taylor, who had requested him to tell the meeting that his absence was due to his having made a previous engagement, and to express his regret that he could not be with them.

Mr. W. SAWYER said that though he knew little of photography, he had been for a long time connected with photographic societies, and was regarded as a very harmless individual, who, on account of his entire ignorance of the subject, might be fairly admitted to their symposia, without the slightest risk of carrying away any secret, or turning to account any of that lore which they very properly kept to themselves (laughter.) He had, however, noticed one thing about photographers, that, besides possessing those personal qualities which commanded esteem and respect, they had, in addition to their love of knowledge, also a very

keen appreciation for the good things of this life (laughter.) The good photographer, he had observed, liked a good dinner, and, as far as he could see, they understood in this way to console themselves under any adverse circumstances in which they might be placed. The Chairman had observed that out of 645 days, was it (laughter)? he begged pardon—hours, during which the sun had been above the horizon, there had been only ten hours of sunshine. The sun, in fact, shone when he liked, and, if he didn't shine, this was how they consoled themselves. Tom Morris, or some other poet, had said: "The bottle's the sun of the table," and if they could not enjoy the camera, they enjoyed the bottle, and between the two they might reach a very happy and comfortable state of existence (laughter.) This kind of thing, he supposed, was what had attracted him towards photography, for, somehow, all his experiences of photographers was entirely of a social character. In continuation Mr. MAWDSLEY referred to the strides which photography had made of late years. Only that day he had been to the private view of a picture gallery, and had been told by the painter of a certain picture that it would have been almost impossible to have produced it without the aid of photography. Ten years ago such a thing as this would never have been admitted, it was a great advance when the artistic world thus acknowledged the claims of photography. (Applause.)

Mr. CH. PEARCE and Mr. T. ARCHER having also acknowledged the toast,

The CHAIRMAN gave the toast of the "Visitors;" and Mr. T. ARCHER, in reply, said that he had always believed in photography as one of the fine arts. He had that day seen a picture which, in all probability, was destined to become one of the most prominent pictures of the season. It was a group walking on the Windsor Castle slopes, the principal figure being the Queen Charlotte, the whole force of the picture depending upon its humour and the intensity of the portraiture. Another picture—"A Scene in a Market"—in the same gallery was one whose features were decidedly photographic—that is to say, the objects were painted with microscopical minuteness and fidelity of detail. In both of these there were defects which photography would have successfully overcome. The first picture had a certain heaviness in the portraiture which the aid of photography would have avoided; while in the second there was a want of the atmosphere which he had seen successfully represented in many landscape photographs. Then there was the wonderful power which photography possessed in the reproduction of works of art. The cheapness of these reproductions placed them within the reach of all, and, speaking as one of the public, this was a department of photography which was of special importance. (Hear, hear.)

Mr. G. W. SIMPSON then, in genial terms, proposed the health of the "Chairman;" and the latter having responded,

Mr. BROOKS replied to the toast of the "Officers;" and the pleasant proceedings came to a conclusion.

During the evening a selection of music was given by Messrs. F. A. Bridge, V. Blanchard, C. Pearce, Burroughs, Cobb, &c.; and a recitation by Mr. T. Hicks.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held at the usual place of assembly, the Museum, Queen's Road, on Wednesday, November 7th, COL. BIGGS in the chair.

The minutes having been read and confirmed,

The SECRETARY read a communication from Dr. Mantell, a corresponding member, entitled "The Splitting of Negative Films" (in our next).

Mr. BRIGHTMAN considered the quality of the washing water had a great deal to do with it. A friend of his in the Isle of Sheppey, who was most particular as to the thoroughness of the washing given, died, and some of his negatives were given to Mr. Brightman, who placed them in a box with a lot of his early productions about which it is probable he was not very particular. The box was put in a damp place, the result being that Mr. Brightman's negatives did not suffer, whereas his friend's were all cracked. The water in the Isle of Sheppey contains a great deal of chloride of sodium, which Mr. Brightman considered deliquesced under influence of damp, and so was the cause of the cracks.

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The CHAIRMAN observed that the stand was not varnished, which was, he thought, a defect. It was a mistake to suppose that varnish was merely ornamental. It protected the wood, and prevented it absorbing moisture and swelling.

Mr. BAYNHAM JONES exhibited a singularly compact and portable equipment. The camera and four dry plates were packed away in his pocket without causing the slightest inconvenience, and, apparently, an umbrella was carried in his hand. He might, he thought, walk down Regent Street without exciting especial attention. The camera was singularly small and portable, the lens was always focussed for any distance beyond twenty yards, and it had about half an inch range in the screw of the flange. The front had a vertical and lateral motion, gained by a right-angled slot like this [] at two corners. The stand packed up, and appeared like a folded umbrella. It was a modification of that described in the YEAR-BOOK for 1877.

Mr. HUGHES admired the compact arrangement exceedingly. He had seen a similar arrangement for giving a double movement to the front twenty years ago, on a camera belonging to Mr. Hugh Owen.

Mr. HOARE, of the firm of Reeves and Hoare, exhibited some examples of Seavey's pictorial backgrounds. A very good specimen, with an exceedingly effective and artistic profile slip, was placed in the room. Mr. Hoare thought Seavey's work was more artistic than the usual samples of such work hitherto produced for photographers; and, whilst admiring the excellence of the backgrounds, took exception to profile accessories, as less true in perspective when used in photography than solid accessories.

Mr. DUNMORE showed a developing holder made of stout wire and india-rubber bands, and some masks of sandpaper to give a matt margin to cameo-enamel cards.

Mr. F. YOUNG exhibited some useful pads for cleaning plates, consisting of a large bung with a ring to fit, which tightened a piece of woollen or other cloth, or wash leather, over the end. Some were formed of vulcanite to use with acids. A little fine pumice powder placed on the pad would not scratch, but was a valuable aid in cleaning. Mr. Oakley was working out the idea commercially. He also showed the new filtering papers lined with mosquito netting, which was a great protection from the paper breaking and wasting some hours' work, and also secured quicker filtering by preventing the paper sticking to the sides of the funnel, which—as photographers knew—retarded filtration.

A discussion on filtration followed, which, as it did not lead to much, we cannot give in detail.

Mr. HUGHES called attention to the advantages of folding the filter papers in a voluted form to aid rapid filtration. Some one objected to rapid filtration as imperfect filtration, to which it was rejoined that the slow filtration which arose from only a portion of the filter paper acting could not be more efficient than the rapid filtration secured by the whole surface acting.

Mr. PEARSON pointed out that in practice nothing answered better than the fluted funnel.

Mr. ALDRIDGE showed a funnel with a piece of sponge in the neck, which he found better than filtering-paper. He showed also a box with a screw to keep cards pressed flat. It was described and figured in the YEAR-BOOK OF PHOTOGRAPHY a few years ago. He also described a cap with green glass for accelerating exposures.

Mr. ARNOLD showed a series of plates taken through various coloured glasses, and the apparatus used to obtain precision, the result showing that white light was quickest.

Mr. COCKING showed a couple of pictures illustrating the advantages of supplemental exposure to light.

Mr. J. T. TAYLOR showed the superior light given by Mr. Hughes' Triplexicon lantern; he also showed and explained the working of Chadwick's Oxygen Retort; he also showed examples of Vidal's polychrome printing; also Mr. Warnerke's plan of attaching his diaphragms to each other like a bunch of keys, to avoid risk of loss; a tripod top with levelling screws; and an improved well bath in case. He also showed some fine examples of oil colouring portraits at the back, as done for the trade by Mr. Saloman; and, finally, Mr. Brice's miniature operating chamber.

The SECRETARY showed a little brush with a gauge attached, for applying an edging of varnish to plates, sent by Mr. Penny, of Cheltenham.

Mr. ARCHER CLARKE showed a hollow desk of tin for holding hot water to warm the baths leaning against it, or to aid in varnishing negatives.

Mr. PEARSON showed some examples of stereoscopic pendulum

figures by Messrs. Tisley and Spiller, and explained the principle of producing them.

Mr. HARRISON showed an ingenious method of cutting oval masks, the apparatus worked on a similar principle to the oval chuck used in turning. Also an ingenious mode of packing plates so as not to touch each other. It consisted in wrapping round each end a continuous piece of string, and placing them in a box.

Mr. WM. BROOKS showed an ingenious dropping-bottle, consisting of a glass tube drawn to a point at one end, the other end having a bell-like expansion, with india-rubber over it; a graphoscope, with arrangement for viewing transparencies; some fine transparencies, of very rich tone, produced by the use of acetate of soda in alkaline development; and a useful tin hot-water bottle, like a dipping-bath.

Mr. BRIDGES pointed out the value of such a hot-water arrangement in developing enlargements on paper, instead of using hot gallic acid; the amount of heat being easily regulated by placing a few sheets of blotting-paper upon the tin bottle.

Mr. DALLAS showed some excellent examples of photo-block printing, known as Dallastint.

Messrs. WRIGHT and Co. showed jeweller's specimen card printed by photo-lithography, in which the patterns of gold chains, &c., were made to very closely imitate gold by being printed in black on yellow paper.

Mr. YOUNG then proceeded to exhibit some excellent slides in Keovil's new lantern.

The meeting was large, and the proceedings, which were interesting, concluded by various votes of thanks.

Annual Dinner.

THE Annual Dinner of the South London Photographic Society was held on Saturday, under the presidency of the Rev. F. F. STATHAM, B.A., and, as usual with these gatherings, passed off very successfully.

In proposing the toast of the evening, "Success to the South London Photographic Society," the CHAIRMAN said he almost looked upon it as his own child, as he had been connected with it almost from the time of its birth, some eighteen years ago. Its existence was certainly justified by the encouragement it had received from so many interested in science and in the art, and he doubted not that, in spite of competition, it had a grand future before it. As the years went on, more valuable, and more extended, and more developed became the art of photography. It was, indeed, almost impossible to limit its area. Architects employed it, engineers employed it, it was used largely in medicine, and, in truth, there was scarcely a science which was not indebted to it in some way or another. In regard more particularly to the South London Society, he thought a great part of its success was due to the fact that it was really a social club of a scientific character; and so friendly was the feeling maintained that it had been free from those defects which too often tended to break up societies. (Applause.)

Mr. COCKING (Hon. Secretary), whose name was coupled with the toast, in the course of his remarks said:—The South London Society had, during the last twelve months, fulfilled its mission by affording opportunities for conversational discussions, which elicited much that was useful. Whilst the Society had had new members, it had also lost others; at the same time, it must be regretted that the numbers did not increase in regard to bringing forward new men who could write papers, thus necessitating the work in that direction being confined to a limited number. Although this resulted in the same persons appearing so frequently, he thought it should not be objected to, as they thus had the benefit of the experience of those who were so well fitted to supply the results of their investigations. As in human life there occurred periods of comparative stagnation, so also in societies. Last year the Technical Meeting was not so good, arising from a want of new inventions; but this year there was a revival in invention, and he hoped that the same revival would take place in the Society with respect to the work of the forthcoming year. (Applause.)

The CHAIRMAN then proposed the toast of "Fine Art Photography." In the course of his remarks he referred to the difficulty which the painter and sculptor had in getting perfect models, as it frequently happened that while the head or bust might be all that was desired, there was a sad falling off in the lower extremities. He believed that the old Greek sculptors very frequently, in their search after beauty, engrafted a well formed foot or hand on to a statue, to the model of which it did not belong.

originally; and, so great were now the resources of photography he was not sure that the photographer (whose task as to models was as difficult, or more so, than that of the painter or sculptor) might not in time do something of the same kind by the joining of negatives. As far as fine art photography was concerned, England certainly took a high place, and none had done more to raise the tone of the art in this direction than the late Mr. Rejlander, in whose works there was a poetic and imaginative feeling and treatment which quite lifted them out of the rank of mere mechanical productions. In coupling with the toast the name of Mr. Valentine Blanchard, he was sure that all present would be agreed there was no one more worthy to respond to it. (Hear, hear.)

Mr. BLANCHARD expressed his thanks for the honour which had been done him, and he did so with the more sincerity remembering the many pleasant gatherings when one who still lived in their memory, far more worthy than himself, responded to this toast. He well remembered the formation of the South London Photographic Society—since the idea was first started in a conversation he had in his own house with Mr. A. H. Wall. From the small beginning the Society had gradually advanced, and he could look back with pleasure and pride to its many successful and profitable meetings. In those days the Society used to pride itself upon the encouragement it gave to art, and for himself he was strongly of opinion that it was the duty of every one engaged in photography to do what he could to make it an art, not to deal merely with the camera as a blind instrument, but rather to make it the intelligent medium of embodying some idea or form of beauty. Photographers had one advantage over painters and sculptors, that it was not necessary for them to devote long years of toil in order to train the hand; photography could be learnt in a dozen lessons, and all that was necessary for the photographer to acquire was to see nature as a painter saw it. On the other hand, the portrait painter had advantages which were, and perhaps must ever be, denied to the photographer. The painter was invited down to the mansion of his sitter, could take his own time as to work, could have every opportunity to study face and individuality so as to represent them in the most favourable aspect; but the photographer was obliged to do the best he could with limited time and surroundings, circumstances which might be favourable or not. He could not study a sitter at his leisure, but had to seize upon the salient points and make the best of them. At the same time, it was impossible not to see that the artist of the present day was greatly indebted to photography. It was a singular fact that the rage for pre-Raphaelitism which did so much to revolutionize the world of painting came in with the advent of photography, and it was a fair assumption to say the old courtly painters such as Laurence and Vandyke, great as they were, would have been still greater had they lived in an age when photography would have forced them to be truthful. (Applause.)

The CHAIRMAN then proposed "Commercial Photography," to which Mr. Mawdsley replied.

The toast of "The Press" followed, coupled with the names of Mr. G. Wharton Simpson, Mr. William Sawyer, Mr. T. Archer, and Mr. Charles Pearce.

Mr. SIMPSON, in reply, said that by a singular coincidence the employés in the printing office of the PHOTOGRAPHIC NEWS had that week congratulated him on the fact that the paper had reached its thousandth number. He could not help thinking that the success of the photographic journals—and they had been successful—was due to the intelligence of photographers, for without this the journals could not have existed. A photographic journal was rather a record of effort and experience on the part of photographers themselves, than an organ of any individual opinion or guidance. Undoubtedly, photography owed much to the printing press, for without it the dissemination and registration of facts discovered would have been impossible. In conclusion, Mr. Simpson referred to Mr. J. T. Taylor, who had requested him to tell the meeting that his absence was due to his having made a previous engagement, and to express his regret that he could not be with them.

Mr. W. SAWYER said that though he knew little of photography, he had been for a long time connected with photographic societies, and was regarded as a very harmless individual, who, on account of his entire ignorance of the subject, might be fairly admitted to their symposia, without the slightest risk of carrying away any secret, or turning to account any of that lore which they very properly kept to themselves (laughter.) He had, however, noticed one thing about photographers, that, besides possessing those personal qualities which commanded esteem and respect, they had, in addition to their love of knowledge, also a very

keen appreciation for the good things of this life (laughter). The good photographer, he had observed, liked a good dinner, and, so far as he could see, they understood in this way to console themselves under any adverse circumstances in which they might be placed. The Chairman had observed that out of 645 days, was it (laughter)? he begged pardon—hours, during which the sun had been above the horizon, there had been only ten hours of sunshine. The sun, in fact, shone when he liked, and, if he didn't shine, this was how they consoled themselves. Tom Moore, or some other poet, had said: "The bottle's the sun of the table," and if they could not enjoy the camera, they enjoyed the bottle, and between the two they might reach a very happy and comfortable state of existence (laughter). This kind of thing, he supposed, was what had attracted him towards photography, for, somehow, all his experiences of photographers was entirely of a social character. In continuation Mr. SAWYER referred to the strides which photography had made of late years. Only that day he had been to the private view of a picture gallery, and had been told by the painter of a certain picture that it would have been almost impossible to have produced it without the aid of photography. Ten years ago such a thing as this would never have been admitted, it was a great advance when the artistic world thus acknowledged the claims of photography. (Applause.)

Mr. CH. PEARCE and Mr. T. ARCHER having also acknowledged the toast,

The CHAIRMAN gave the toast of the "Visitors;" and Mr. T. ARCHER, in reply, said that he had always believed in photography as one of the fine arts. He had that day seen a picture which, in all probability, was destined to become one of the most prominent pictures of the season. It was a group walking on the Windsor Castle slopes, the principal figure being the Queen Charlotte, the whole force of the picture depending upon its humour and the intensity of the portraiture. Another picture—"A Scene in a Market"—in the same gallery was one whose features were decidedly photographic—that is to say, the objects were painted with microscopical minuteness and fidelity of detail. In both of these there were defects which photography would have successfully overcome. The first picture had a certain heaviness in the portraiture which the aid of photography would have avoided; while in the second there was a want of the atmosphere which he had seen successfully represented in many landscape photographs. Then there was the wonderful power which photography possessed in the reproduction of works of art. The cheapness of these reproductions placed them within the reach of all, and, speaking as one of the public, this was a department of photography which was of special importance. (Hear, hear.)

Mr. G. W. SIMPSON then, in genial terms, proposed the health of the "Chairman;" and the latter having responded,

Mr. BROOKS replied to the toast of the "Officers;" and the pleasant proceedings came to a conclusion.

During the evening a selection of music was given by Messrs. F. A. Bridge, V. Blanchard, C. Pearce, Burroughs, Cobb, &c.; and a recitation by Mr. T. Hicks.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting was held at the usual place of assembly, the Museum, Queen's Road, on Wednesday, November 7th, Col. BIGGS in the chair.

The minutes having been read and confirmed,

The SECRETARY read a communication from Dr. Mantell, a corresponding member, entitled "The Splitting of Negative Films" (in our next).

Mr. BRIGHTMAN considered the quality of the washing water had a great deal to do with it. A friend of his in the Isle of Sheppy, who was most particular as to the thoroughness of the washing given, died, and some of his negatives were given to Mr. Brightman, who placed them in a box with a lot of his early productions about which it is probable he was not very particular. The box was put in a damp place, the result being that Mr. Brightman's negatives did not suffer, whereas his friend's were all cracked. The water in the Isle of Sheppy contains a great deal of chloride of sodium, which Mr. Brightman considered deliquesced under influence of damp, and so was the cause of the cracks.

Lieut. LYNAGHT considered it was mainly due to the difference in the gums used in the varnishes that are made.

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printed a number of pictures of Indian architecture in the depth of winter, and, as a consequence, lost over two hundred in the same way as Dr. Mantall. He thought that the difference in the temperature had much to do with it, as when they were taken the temperature was from 90° to 115°; the expansion of the glass, he fancied, was possibly the cause.

Lieut. LUGGART remarked, that if so, theoretically the cracks should close up when the glass regained its normal state. He still adhered to his opinion that the fault lay with the gums, especially as the cracks did not appear for years.

Some further discussion, and private matters of the Association, took up the rest of the time. Some very fine paper negatives, exhibited by Col. Biggs, the subjects being Indian scenes, were greatly admired, the delicacy and sharpness of detail being absolutely perfect.

A cordial vote of thanks, proposed by Mr. BRIGHTMAN and seconded by Mr. HOLT, to Dr. Mantall, for his interesting communication, closed the proceedings.

Talk in the Studio.

A GERMAN "PHOTOGRAPHIC NEWS."—A new journal is announced with the title of the *German Photographic News*, and the following imposing array of names is given as forming its staff: K. Schewer, President; W. Zink, Vice-president; C. Bellach, Secretary; K. Feist, Cashier; F. Haugk and Th. Herikel, Assessors. *The Photographic News* of London, which has issued a thousand weekly numbers—the only photographic journal in the world which has done so much—and has commenced a thousand more, in announcing its staff must simply mention photographers in every part of the world!

ANILINE BRONZING FLUID.—Take ten parts of aniline red and five of aniline purple, and dissolve in one hundred parts of alcohol at 95°, taking care to help the solution by placing the vessel in a sand or water bath. As soon as the solution is effected, five parts of benzoic acid are added, and the whole is boiled from five to ten minutes, until the greenish colour of the mixture is transformed into a fine light-coloured bronze. This bronze is stated to be very brilliant, and to be applicable to all metals, as well as to other substances. It is easily laid on with a brush, and dries promptly.

HALATION.—It has long been known that the photographic image of a luminous object is dilated at the expense of the dark parts or the field itself. This has been merely attributed to a gradual advance of the chemical action (without further attempt at explanation). The phenomenon has recently been studied by M. Angot (*Journal de Physique*). He finds that the dimension of the images increases with the intensity of the light, with the duration of exposure, with the sensibility of the plate, with the diminution of the aperture of the objective, and that it is greater when the plate has not previously been impressed by diffuse light than when it has. M. Angot discards the hypothesis of a mysterious advance of chemical actions, and shows how the phenomena are accounted for by the ordinary theories of optics. This variation of the diameter of images is inevitable in practice; to render it very small the operator should satisfy himself that the objective used is applanatic, i.e., free, as far as possible, from aberrations of sphericity and refrangibility. He has only then to take account of variations due to diffraction, which may be attenuated by using objectives of large aperture. It is by using an objective without sensible aberration and of fifteen inches aperture that Mr. Rutherford has succeeded in obtaining his magnificent photographs of the moon.—*Nature*.

TESTS FOR COPPER SOLUTIONS.—The solutions of copper possess a blue or green colour, which they retain, even when considerably diluted with water. With caustic potash they give a light blue bulky precipitate, turning blackish brown or black on boiling the liquid. Ammonia and carbonate of ammonia produce a bluish white precipitate, soluble in excess of ammonia, yielding a rich deep blue solution. The carbonates of potash give a similar precipitate to the last, but insoluble in excess of the precipitate. Ferrocyanide of potassium gives a reddish brown precipitate. Sulphuretted hydrogen and hydrosulphuret of ammonia give a blackish brown or a black one. A polished rod of iron, on immersion in an acidulated solution, quickly becomes coated with metallic copper.—*Scientific American*.

To Correspondents.

J. B.—Black masks of all shapes and sizes have been used in photography from its earliest days. We never heard of any being patented, nor do we see how they can be patented. We think you may go on using them in safety, none daring to make you afraid. **PERPLEXITY** is in a difficulty with some kind of defects in his negatives, and besends us one by post, that we may examine the defects and help him out of his trouble. He packs the glass negative in a piece of cotton wool and a piece of paper. It accordingly reaches us in a hundred scratched fragments. The broken mass of glass and wool and paper are brought to us by the postman in a brown paper bag, with a message from our civil postmaster to the effect that the broken mass arrived at the post office in such fragments that he was obliged to place them in a bag, although the sending of such an article by post was in direct opposition to the law. Attempting to examine it has covered our desk with minute spicula and particles of glass, at once dangerous and uncomfortable. We have often warned our correspondents against this practice. Glass can only be sent safely in a wooden box. The negative being destroyed, and the details of the trouble insufficiently clearly stated, we fear we cannot help our correspondent until we receive further details. Is the defect a crapy reticulation of the collodion film?

F. W. B.—When you speak of breaking glass plates in working photo-lithography, we suppose you probably mean photo-collodography. It is necessary to use very thick glass indeed—nearly an inch thick is usual—and if this be bedded carefully, to avoid unequal pressure, it will not break. As a rule, a platen press—that is, one giving a flat pressure—answers best. The scraping pressure with an edge of the lithographic press is the most dangerous. The prints have not yet come to hand.

PELLICLE.—Perhaps there is no patent of any kind in existence that some of its opponents have not declared invalid. Such statements have no value: until a patent has been declared void by the Court of Chancery it is in perfect force. The patent to which you refer has never been litigated at all, and is in full operation. If you employ the method for your own use it is not likely you will be proceeded against; but that rests with the patentee.

SCOTTELLARI.—Too late for insertion in this number. It shall have our attention before the next.

R. KERN.—Received. Many thanks.

H. WILSON.—We will hand your letter to our Publisher. The supply of copies of the *News* does not come within the Editorial department.

A. FORD SMITH.—Many thanks. We will take care to see it, and possibly use.

STARTER.—The lenses you name may chance to be good or bad; there is no guarantee of quality in the names. 2. Central stops are desirable. A stop may be placed in front of a portrait lens, but it is not so good as in the centre. It is easy to add central stops. 3. We cannot give you any more precise details than we have published. 4. You will find it useful to acquire familiarity with the metrical system of weights and measures; but if you will refer to any special formula we will translate it for you. You will find tables to aid you in almost all the issues of our *YEAR-BOOK*.

CARBON TRANSFERS ON CANVAS.—See the Autotype Manual.

A. E. B.—Acetic acid and collicine are constantly used as restrainers. B. For very large plates a dipper with feet projecting below the ledge on which the plate rests is desirable; then rest the dipper against something, and place the plate in with both hands. C. If we could tell you the precise chemical conditions which make the difference between rapid and slow plates, we should have solved one of the important problems in photography. D. No. Remaining answers next week.

NIGHT PHOTOGRAPHY.—We do not know of any one using the magnesium light for portraiture at present. Mr. Vanderwyde will, we believe, shortly open an establishment in Regent Street for night photography by means of his patented light. Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. W. WYNN, Derby.
Photograph of Mr. Henry Holloway.
Mr. H. LEW, Huddersfield.
Three Photographs of John Roseberry.
One Photograph of Rev. Thomas Greenbury.
Mr. & V. WHITE, Reading.
Ten Photographs of Bishop Creighton.
Mr. H. WHITE, Cheltenham.
Photograph—The European Conference at Constantinople.
Mr. W. COLLIS, Napier, New Zealand.
Three Photographs of Crater of White Island.
Mr. T. M. BARNWOOD, Northampton.
Photograph of Miss M. Farningham.
O. BARNETT, Scarborough.
Seven Photographs of Scarborough Aquarium.

The Photographic News, November 30, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE OLD CARTE-DE-VISITE DAYS—IMPROVEMENTS IN PHOTOGRAPHING UPON WOVEN FABRICS.

The Old Carte-de-Visite Days.—The old-fashioned carte-de-visite, with its tessellated pavement and fluted column, has become a thing of the past. No one, probably, will regret the circumstance except those who happen to have a large stock of such properties on their hands. It is now very seldom that one sees a pillar—or even a balustrade—in such photographs: both the public and photographers have grown wiser. We did not impose upon anyone that we lived in a mansion, and that our back window looked out upon an Italian lake, when we handed the pictures round to our friends. When the thing was new, it was all very well, and background and accessories did not matter much. A personage appeared without his hat in what appeared to be a cold and draughty corridor; but beyond hoping that he would not take cold under the circumstances, the picture made little impression besides. It was when the favoured background began to get known that the thing grew monotonous; and the first thing the Joneses remarked when you handed in your portrait was: "Ah! Mr. Kammarer has photographed you with that pretty balustrade of his as a background; all our girls have been taken with it!" Upon which you then and there mentally resolve to throw the whole batch of cards behind the fire as soon as ever you get home. Another thing has probably led to the abandonment of these cut-and-dried accessories. When first introduced it seemed so good of the photographer, not only to take your portrait, but to throw in unlimited furniture as well, one could not but feel pleased at such liberality. But after a time, when chairs and tables, vases and pillars, bookcases and pianofortes, all of them as pasteboard as pasteboard can be, had been reproduced in profusion, one began to ask oneself whether, after all, it was a picture of these, so much as a portrait of oneself, that was desired; and so the custom of late has become for photographers to devote themselves more especially to the sitter himself, rather than worry about "properties." And as one cannot be taken full-length very well without showing a good deal of extraneous and uninteresting matter, we have come to the general custom of depicting our sitters in half-length or vignettised style. No doubt we shall still see many full-length portraits, but not from second-rate studios. Few portraits are more charming than the standing figure of an elegantly dressed lady; but then to render such a model well, a thorough artist is required, who can pose and arrange with taste. It is for this reason that we are glad to see that most portraits are now-a-days taken half-length or vignettised, since it is far easier to produce a successful result so, than with a standing figure, as in the case of the old cartes-de-visite. A photographer who has but little time, who has to pose rapidly and get rid of his customers in a few minutes, even if he is a capable and talented man, cannot possibly pose standing or full-length models, within the brief period at his disposal, in anything like a satisfactory manner. But when he has not to study the pose of the model's feet, half of his difficulties fall away at once, and the chances are he makes a very tolerable portrait. How often does it happen that a gawky awkward portrait appears to very good advantage after the legs have been cut off, and even a half-length picture, which has not pleased before, does so at once if only head and shoulders are visible. The great popularity enjoyed by the vignette is certainly due to the fact that the limbs of the model, often so awkwardly posed, are not visible. One never knows what to do with legs and arms, and it is these which usually offend in a photograph. We repeat, it wants a very good photographer indeed to deal satisfactorily with the rebellious limbs. Altogether the photographer has much to be thankful for that

the fashion for whole-figure portraits has gone out. He has now little to fear from clever sitters who want to be taken "like this, don't you know, without any damned nonsense!" and whose great idea was to sit astride a balustrade smoking short pipes, or with hats cocked knowingly, and who affected little canes with tassels depending therefrom. There is nothing left for these gentlemen now but to sit down and "have their heads taken off" quietly. It would be difficult to say how changes in style of portraiture are brought about, and why some things become popular and others do not; but there is little doubt the last Paris Exhibition had much to do with the introduction of dark printing and Rembrandt portraiture, the Adam-Solomon pictures in great measure influencing photographers. We wonder whether next year's show on the *Champ de Mars* will work as great a change. There is plenty of room for progress in many branches of the art, and it will be with some degree of expectancy that many of us will await the opening of the World's Fair for 1878.

Improvements in Photographing upon Woven Fabrics.—We see that an application for a new patent has been made for "improvements in photography relating to the production of photographic pictures on woven fabrics." We only trust that the "improvements" are real and effective, although, for our part, we can see little difficulty in the production of such prints in the ordinary way. Perhaps, however, with these "improvements" somebody will see his way clear to applying photography to the general printing of fabrics, which, as our readers know, is a very extensive trade at the present day. As matters, however, stand at present we cannot conceive why photographers do not take up more generally the matter of fabric printing. A photographer's work is, after all, little else than supplying the public with knick-knacks more or less useful; for every one who wants a portrait taken for family purposes, a dozen require them in order to be in the fashion, and because other people have them. So that if photographers would only remember this, and have in view the submission to their customers of something novel or taking, without troubling themselves much about its utility, we think they would occasionally do a little stroke of business that would not be unwelcome, and the printing of photographs upon fabrics appears to our mind a means that might well be applied in this way. Handkerchiefs, d'oyleys, mats of all descriptions, serviettes, fans, and a hundred other things of the kind might be ornamented or marked by the aid of photography. If a photographer could supply a set of d'oyleys impressed with the portraits of eminent persons—statesmen, artists, authors, actors, &c.—he would soon find customers for the novelty; in the same way, if he would undertake to mark a dozen handkerchiefs with the owner's portrait, or to ornament screens or mats with pictorial photographs of one kind or another, he would soon do a bit of business in such things. It might not lead to very extensive dealings, perhaps, but in these times it would be remembered progress and novelty are the order of the day.

FRENCH CORRESPONDENCE.

THE CHAMBRE SYNDICALE AND PHOTOGRAPHIC PATENTS—M. LEVY'S REPRODUCTIONS OF THE LOUVRE MUSEUM AND THE NEW OPERA HOUSE—M. BOIVIN'S COMPARATIVE EXPERIMENTS WITH CHARDON'S EMULSION AND THE GELATINE PELLICULE—M. RODRIGUES ON PHOTOGRAPHY IN THE STATE PAPER OFFICE OF LISBON.

THE *Chambre Syndicale* of photography was occupied on the occasion of its last meeting with a subject which comes well within its deliberations, namely, that of patents. The *Chambre* does not desire to discuss in any way with controversies connected with patents, but confines its efforts to making patents known as widely as possible. It is certain that in France, at any rate, the great majority of patents which are daily taken out do not come to the know-

ledge of those who are most interested in the details of them. Everybody, no doubt, has the right to go to the Patent Office, and to consult any of the specifications which are placed at the disposal of the public; but no one practically makes use of the right he possesses, which necessarily entails a certain loss of time and other inconvenience. In the first place searchers are liable to search for matter which has already been looked for a dozen times before by others, and have to undertake long and weary work to discover nothing new; on the other hand, persons engaged in trade, and photographers especially, if they do not acquaint themselves with what has gone before, are liable to pay large sums for so-called secrets, &c., which have been published to the world several times already. Sometimes, again, they are stopped in their work by reason of the existence of patents which have no validity after all. The *Chambre Syndicale* is of opinion, therefore, that it may be able to render very good service to photographers by carefully examining for them the patents which most concern them, expressing an opinion of the value thereof, and making known details as far as this is sanctioned by law. This very important step is to be very seriously considered at future meetings of the *Chambre Syndicale*, and there cannot be a doubt it will materially benefit the photographic public.

M. Levy—who, as everybody knows, not only produces the magnificent stereo slides which bear his name, but also prints upon papers which are second to none—has just published a series of reproductions taken from the *Galerie des Antiques* at the Louvre. All the *chefs-d'œuvre* of ancient art in our National Museum are represented in their most advantageous light. Despite the difficulties of lighting which he had, as a matter of course, to contend against, M. Levy has been able to produce work good in every respect. We may say the same for the beautiful paintings, which are reproduced in an album, of the New Opera, which the skilful photographer has recently published. The artistic splendours of the famous staircase, of the public foyer, of the foyer in the ball-room, and of all the rich decorations in this wonderful building, are as well rendered as the architectural design, and studies of sculpture which ornament the exterior of the building.

M. Boivin has recently been undertaking some comparative experiments with Chardon's dry emulsion and the gelatino-bromide pellicle. The result of his investigation he has now communicated to me. Those secured by the first of these products are, he assures me, perfect in their nature. He only regrets that the *modus operandi* is a costly one, and that the exposure of the film lasts for some minutes, at any rate in the case of some objects which are well exposed upon the gelatino-bromide pellicle in five to ten seconds. My friend hopes that M. Chardon will complete his process by accelerating it in some way. As to the experiments which M. Boivin has made with the gelatino-bromide pellicle, they may be considered satisfactory. A distinguished amateur of Saint Etienne (M. Durand) having forwarded a specimen of the Kennett pellicle and half-a-dozen plates prepared with it, my collaborateur proceeded to test the product forthwith. His experiment was made upon the 8th of November, and he says of it: "The light on the day in question was not most certainly of a favourable character, since No. 4 degree on my photometer necessitated an exposure of not less than ten minutes, while the same result would have been obtained in fine summer weather in three or four minutes. The lens employed was a simple quarter-plate one, having a focus of sixteen centimetres with a diaphragm of eight millimetres. I was able under these circumstances to secure a perfect negative in five seconds upon the gelatine pellicle." M. Boivin throughout his experiment followed the data supplied by M. Odagiri and M. Kennett in respect to development, &c. At the same

time he was considerably surprised at the effect of adding a drop of glucoside of ammonium, to intensify the image after all the details had appeared; the result was a very excellent one. The important point of the gelatino-bromide process, according to M. Boivin, is the possibility of securing speedy and uniform drying, and thus avoiding dust.

M. J. S. Rodrigues, the director of the photographic establishment of the Royal Cartographic Department of Portugal, has just published in French an interesting work giving all the details of the establishment under his direction. The method in which it is fitted up and the processes in use at the establishment are all clearly explained. The *fac-simile* of an ancient manuscript produced under M. Rodrigues' direction illustrates the volume of which we have spoken. In perusing this interesting volume, and examining the perfect illustration which accompanies it, one cannot fail to be struck with the completeness with which photography has been applied in Lisbon by the Portuguese Government to the production of Government work, and it would be matter for congratulation if every country possessed a like establishment.

This evening there will be held at the *Palais Royal* the fifth banquet of professional photographers.

ERNEST LACAN.

SPLITTING OF NEGATIVE FILMS.

BY DR. MANTELL.*

A COMMUNICATION by Mr. Dunmore to the *British Journal* for January 19th of current year, on the splitting of negative films, I should probably have passed over as possessing no particular interest to myself, had I not suffered to some extent from a similar cause this winter. In my operating room, situated over my stables, I have kept several boxes of negatives which I took in India between the years 1865 and 1873, and which I prize considerably. The room is generally damp, and was extremely so during the past extraordinary winter.

On examining the negatives a few weeks ago I was horrified to find that all of them were covered with moisture, and that the films of several had split. These negatives were taken with Thomas's and Mawson's collodion, generally in combination, and were protected by Rouch's negative varnish. I do not believe that either of these substances has been the cause of the injury, nor do I think that the damp has *per se* been the active agent.

The splits are all of the same character—wavy, semicircular, and angular; the film is loosened, and the split parts could at the time be moved about with the finger, being separated from the glass. The following table shows the year when the negatives were taken, and the number of these in which the films have suffered.

Date of taking Negatives.	Number of Negatives taken.	Number of Negatives with Split Films.
1865	23	1
1867	33	9
1873	32	1
Totals	88	11

My impression is, that in most instances, where good chemicals are used, that the splitting of films is due to a trace of hyposulphite of soda remaining in them. I feel certain that this is the cause in my own negatives, from the fact that those which have suffered were taken in the field, and that imperfect washing was common under the circumstances. Had the extreme dampness of the weather been to blame it is reasonable to suppose that the

* Read before the West Riding of Yorkshire Photographic Society.

bulk of the negatives, perhaps all, would have had split films, as they were kept under similar conditions in deal boxes, and were, moreover, quite wet when examined. I think the reason of the negatives having remained so many years unaffected is that the trace of hyposulphite was so exceedingly small that it required an abnormally damp season to act upon them, and that, had there not been an actual condensation of moisture on their surfaces, they would not have suffered at all, ordinary hygrometric conditions of the atmosphere being insufficient to penetrate the varnished films.

Recent Patents.

MR. JOHNSON'S NEW CARBON PROCESS.

THE following is the specification of Mr. Johnson's new patent for improvements in the carbon process, the marvelously fine examples of which we recently noticed.

This invention consists of sundry improvements in the photographic operations by which pictures are obtained in carbon or other permanent pigments, a process which has also been called "the autotype process," or autotype.

As ordinarily practised this is well understood, many editions of the Manual of the autotype process originally written by the inventor of these improvements having been published.

My improvements will be best described under two heads or chapters. A. Those which relate to the double transfer process. B. Those which relate to the simple or single transfer process, some of which will be found of important use for other processes of photography, viz., whenever a negative has to be taken and preserved.

My first improvement consists in the substitution of alizarine, the colouring principle of madder—well known to be properly stable when combined with an earthy or metallic base—instead of the fugitive preparations of cochineal hitherto used for obtaining the brilliant purple tones for pigment prints. Small quantities of alizarine have already been used combined with other colouring matters, such as Indian red; but when sufficient is employed in the usual way to give the red tint alone, the paper employed to receive the finished proof becomes stained red or pink instead of remaining white, or the pigment paper becomes insoluble even when not exposed to light. As is well known, alizarine is soluble in alkalies and their carbonates, and is precipitated therefrom as a coloured lake by the earthy and metallic salts, and particularly by alum, which yields a brilliant red lake, and by sulphate of zinc, which yields a purple lake. But the salts of alum and zinc also precipitate gelatine, which is the basis of the compound used for preparing the pigment paper, so that when sufficient alum is employed to fix or render insoluble the alizarine lake, that lake, when mixed with the gelatine and bichromate of potash to form the pigment paper, renders the pigment compound insoluble and unfit for use, or it becomes so by keeping. I avoid this result by employing sufficient aluminous salt to produce the full red colour, and afterwards add a lime or magnesian salt to effect complete insolubility. I thus obtain the brilliance and permanence due to the alizarine without rendering the gelatine insoluble. The alizarine of commerce is so variable in quality and strength that it is impossible to give very definite quantities for the preparation of the lake. I find, however, that for every part of dry, real alizarine, about five parts of liquid ammonia (liquor ammonios fortis of the pharmacopœia of London), five parts of pure ammonia alum, and five parts of chloride of calcium, or eight of sulphate of magnesia, are required. The alizarine is dissolved in the ammonia, with one hundred parts of water, and the alum in solution is added. When well mixed the chloride of calcium is added, and the precipitated lake cast upon a filter, and dried on chalk stone, as is well understood. The salt of limes is in excess, but such excess is not precipitated, but remains insoluble.

A pigment paper made by a mixture of China or Indian ink, or other black pigment, and alizarine lake, so as to have a rich maroon or amaranth tint, may be "toned" by a weak solution of perchloride or persulphate of iron, to which a few drops of hydrochloric acid have been added, in the same way as the tints produced by a salt of silver are "toned," or turned from red to violet by the salt of gold.

I claim the use of alizarine lake formed by alumina mixed with lime magnesia, or other earthy matter capable of fixing the alizarine without rendering insoluble the gelatine when employed for pigment paper. And I claim the mode described for "toning" prints produced by such lake or lakes.

My second improvement consists in a new method of preparing the pigment paper, and of sensitising the same when already made, but made insensitive—that is, without the bichromate.

It has been usual to spread the gelatine pigment compound upon the paper in as cool a place as possible, and immediately to hang it up to dry in such cool, airy place. In the same way, when the paper is made insensitive it is rendered sensitive by immersion in a solution of the bichromate of potash or other bichromate, and is then suspended in such cool, airy room.

I operate in a totally different manner. After spreading the gelatine compound upon the paper, or after plunging the already prepared paper into the bichromate bath, I lay it flat upon a level surface upon a plate heated to 90° or 100° Fahrenheit, and I maintain the wet pigment paper in this position for from fifteen to thirty minutes, by which time the denser particles of colour have settled to the lowest stratum of the pigment compound, particularly such heavier or larger particles as have escaped filtration, or which have clogged together during the preparation, and which would form a blot or spot upon the ultimate picture. Papers so treated, having a less dense pigment compound on the surface and a denser compound below, yield more delicate half-tones and more vigorous shadows than paper made in the ordinary way; and, as water is lost during the heating, the compound becomes more concentrated and does not run from the paper when suspended in warm weather. In a hot atmosphere the duration of the heating operation while the paper is in a horizontal position may be considered greater than has been stated. It is scarcely necessary to say that the paper so treated must either be allowed to cool before being suspended vertically, or the operation must last till the gelatine compound is too thick to run. It is important that perfectly pure bichromate salt be used, that a small part of the bichromate be converted into neutral salt to ensure the compound from the presence of free acid.

My third improvement consists in substituting for glass or porcelain, used as the temporary support for holding the print by suction during the development, card or millboard made by some waterproof cement instead of by paste or glue, and with a white, highly-polished face of paper prepared with shellac or other waterproof substance. Or I use sheets of tinned iron or zinc faced with such highly-glazed impervious paper, such paper being attached to the metal by india-rubber or marine glue, or dissolved shellac, either by direct application to the face of the metal, or by folding over the edges of the paper and attaching the edges by cement behind the plate.

Such prepared paper may be renewed when worn out, *ad infinitum*; and after each operation of developing a picture it has only to be rubbed over by a flannel, and a little wax and resin dissolved in benzine, as is well understood, to be ready for another operation.

Such prepared panel is not only much more easily handled than the flexible supports hitherto used, whether made of a simple coating of shellac (see first edition of Autotype Manual), or the more complex coating used by Mr. Sawyer, but is far more economical, as when attached to the panel or plate it may be used a great number of times without renewal.

I claim the use of cardboard made impermeable to water, and sheets of metal coated with prepared paper, as the temporary support in obtaining a non-reversed proof by pigment printing.

It is usual after the print has been developed upon the temporary support, and has been fixed by immersion in alum, to allow it to dry, and afterwards to transfer it to prepared paper called the "second transfer paper."

Instead of thus operating, my fourth improvement consists in treating such print after leaving the alum bath, and having been rinsed well in water, to allow the washed print to drain well; but before drying I coat it with a gelatine solution rendered opaque by zinc white or other white pigment. After thus coating the plate or sheet of cardboard, it is placed in a horizontal position, and when the film of white gelatine has set or solidified, a thin bit of tissue or other thin paper is wetted in water, and laid upon the solidified gelatine. A little pressure with a brush or sponge causes the paper to adhere, and when the whole is dry it may be removed to be mounted subsequently on cardboard, or it may have the cardboard mount applied before being taken from the glass. Or, instead of the intervening paper, the card mount may be applied directly upon the gelatine, and pressed thereon.

After the pressure has been continued for some time the card will have become permanently fixed. I would, however, observe, that when the negatives are old or imperfect, and the prints require much touching, and particularly when the prints have been developed upon collodion, to be described, the direct application of the white while the print is in the wet state cannot be made. In these cases the print must be allowed to dry before the touching or spotting to correct the defective prints is made, and the gelatine and white must be applied subsequently. I prefer, however, to give to the wet prints before drying a thin coating of gelatine, or of gelatine and chrome alum, to fill up the hollows and support the relief which defines the picture during the drying operation. Pictures so treated are greatly superior to those which have been allowed to dry without such treatment. I do not, however, claim the use of transparent gelatine, but that only in which the gelatine has been made opaque to replace the more or less costly double transfer paper—not only on the ground of its economy, but that the results are greatly superior, being, in fact, equal in every respect to a single transfer print upon opal glass.

My fifth improvement consists in the use of a solution of gelatine—say, of four per cent. strength—rendered insoluble when dry by a small quantity of chrome alum, as is well understood, instead of the usual collodion coating for preparing the temporary support when a polished surface is required. I pour this solution on the plate prepared by wax or stearine, as is usual when collodion is used; I allow it to dry, and before applying the print I pass the prepared plate into warm water to soften the gelatine and remove the excess of chrome alum. After this treatment the insolated print must be applied to the gelatine coating, and the development proceeded with as usual when collodion is employed. I claim the use of the well-known gelatine solution for this purpose.

Chapter II.—My first and chief improvement under this head of my invention consists of a new method of obtaining reversed negatives, without which, as is well known, prints produced by the single transfer process of pigment printing are themselves reversed, as when an object is viewed in a mirror or looking-glass.

The only certain mode of removing the collodion film from the glass upon which it has been taken, so as to apply it to print upon the side in contact with the glass, consists in pouring upon the negative a solution of gelatine, allowing the gelatine film to dry, for which from twelve to twenty-four hours are required, according to the thickness of that film upon the dry gelatine: a coating of collodion is then poured, which is again allowed to dry, and the compound pellicle with the adhering negative is detached from the glass.

Instead of this tedious preparation, which renders the negative incapable of being employed for printing for so long a period, I prepare the double film of gelatine and collodion beforehand upon a clean plate prepared with a film of wax or stearine, and I apply it, when detached, to the surface of the finished negative; but, as is well known, such application cannot be made directly, as the gelatine swells, extends, and curls up, and cannot be made to adhere. I avoid this difficulty by immersing both negative and double pellicle in water to which sufficient alcohol has been added to prevent the absorption of the water by the gelatine, and its consequent extension and retraction, and by using this fluid slightly warmed to a greater or less degree, according to greater or less quantity of the alcohol. In practice I find equal parts of rectified spirits and water, and a temperature of from 80° to 90°, to give the best results; but there is a wide margin as regards the liquid, and the adhesion takes place even without artificial heat in summer weather. As soon as the gelatine begins to dissolve without the preliminary swelling—and when this is observed the surface of the gelatine and that of the negative are brought together under the mixed fluid, and are lifted simultaneously out of that fluid and placed upon a horizontal support—a piece of oiled paper or oiled silk is then laid over them, and pressure given by the squeegee or other means. When quite cold the two surfaces will be found united, and the pellicular flexible negative may be lifted from the plates, and if placed between the leaves of highly-dried paper under pressure it will dry rapidly, quite straight, and may be used immediately with either side of the negative applied to the sensitive paper. Such pellicle negatives may be worked up exactly as if on glass when prepared by varnish or otherwise for that purpose.

I have alluded above to a double pellicle, as this is the best I have found for the purpose; but it is evident that a simple sheet of gelatine of commerce may be substituted, the only disadvantage

being that it is acted upon by moist air unless protected by a coating of collodion or varnish. It is equally obvious that a sheet of paper made more or less transparent, coated with gelatine or some other adhesive hollow body, may be used. I also find that such bodies—viz., a sheet of stout collodion, a sheet of talc, or porous paper—may be attached to negatives in the way described by introducing into the warm weak spirit a portion of gelatine in solution. The manipulations are the same, sufficient gelatine to effect the adherence of the surfaces being left after the action of the squeegee.

As is well understood, the glass must be prepared with an infinitely thin stratum of wax before applying the collodion to form the negative to be removed from the glass, or if this be not done the finished negative must be immersed in water acidified with chlorhydric or citric acid, and maintained therein until the pellicle show signs of becoming detached; and if the negative has been varnished, such varnish must be removed by a solution of a caustic alkali or spirits of wine before being placed in the acid bath, as is well understood. It must then be washed in water to remove the acid, and is ready for immersion in the water and alcohol.

When the negative is large, or where great definition is not required, instead of the gelatine and collodion pellicle I use paper made transparent, coated with a solution of gelatine or gelatine and chrome alum, and I apply it to the negative exactly as a carbon print is transferred from the temporary to the permanent support, as is well understood; and when the negative is very large I prefer to operate in a different manner. I coat the edges of a large sheet of plate glass with a solution of caoutchouc, or as for the preparation of a dry collodion plate. Upon this plate I apply a sheet of thin transparent paper, which has been wetted with a one per cent. solution of bromide of potassium in water. When this paper has dried I apply a coating of bromide of silver emulsion, diffused either in collodion or a solution of gelatine, and I develop and fix the negative after exposure in the ordinary manner. When the finished negative has become dry, I apply another sheet of transparent paper, previously coated with gelatine or gelatine or chrome alum, as before described. The negative is thus imprisoned between two sheets of transparent paper, either of which may be worked upon by a lead-pencil or stump to any extent.

It is obvious that even if the negatives are not required to be reversed, the process described offers great advantages:—1st. On the ground of economy, plate-glass being replaced by gelatine and collodion. 2nd. For transport or transmission by post. 3rd. For facility of storage, &c., &c.

I have described the transfer as taking place upon plain pellicle or paper, but pellicles or paper with a printed border or an inscription may be employed; or a second negative, or carbon print on a transparent medium, may be used as the transporting film, if the negative and pellicle negative have been taken each with an appropriate mask or “cache,” as is well understood. Again: such transferred negatives may be trimmed with scissors, and inserted in appropriate negatives in which a space has been left transparent, so that the doubled negative may yield pictures with frames or borders, or figures with landscape backgrounds or other combination.

I claim the mode of transferring negatives described, simple or compound.

My second improvement in single transfer pigment printing consists in substituting for the usual single transfer paper a card or board formed of two or more layers of paper cemented together by bleached shellac dissolved in liquid ammonia, or in a solution of borax, or by marine glue or other cement insoluble in water. By this means no mounting of the ultimate print is required. I apply this process to the prints of enlargements, which are thus obtained upon the board to be used without any intermediate mounting and to the printing of cartes-de-visite, the pellicular negatives being trimmed to the proper size and mounted with or without borders upon a sheet of plate glass. Such collection of negatives may be rendered capable of being printed simultaneously by proper selection if many are used, so that only negatives of equal printing density are employed on the same plate. If this be not possible, the negatives less dense than the others are brought to the same degree of translucency by the addition of gelatine pellicle to the back, or by transparent paper, as is well understood. On cutting the negative to the proper size allowance should be made for the “safe edge,” the line of opaque, or nearly opaque, varnish round the picture, although this is scarcely necessary in single transfer printing, unless the pigment paper be too soluble, or the prints require to be greatly reduced from excess of density from over-printing. Any number of negatives may be thus printed together, but it will be convenient probably

to arrange them in dozens in such a manner that they have only to be cut horizontally and vertically by the shears or cutting machine to yield one dozen cartes.

In the preparation of the paper card or panel described I prefer that such paper, &c., have a film of opaque white over the surface to receive the print, in order to hide the grain of the paper.

Enamel paper has not hitherto been successfully used for single transfer paper, as when the pigment for producing the enamel surface is used in sufficient quantity for this purpose it becomes stained by the bichromate of the pigment compound. I find, however, that if kaolin or china clay, or starch, or other substance not combining with the chromic acid, be employed as the pigment to give the enamel facing, no such stain occurs.

I substitute one or more of these substances for the zinc or lead or barytes white hitherto employed for facing or enamelling paper, and proceed in the ordinary way to prepare paper, preferring that this be as thin as can be successfully used. When this coating is dry it is cylindered in the usual way, and upon the prepared surface I apply a solution of the well-known gelatine and chromic-alum compound, which is well known.

My third improvement consists in the use of an extremely thin paper for preparing the single transfer paper, chiefly for the production of prints for illustrating books, so that the mounted pigment photograph shall not be materially thicker than a print from an engraving upon India paper. I obtain such paper by immersing very thin paper *vegetale* or tracing paper into a solution of white shellac in liquor ammonia to which a portion of albumen has been added. Say shellac two parts, strong liquor ammonia one part, albumen of egg one part, water twenty parts; dissolve by gentle heat, and filter.

Notwithstanding the extreme tenacity of such paper it withstands perfectly the operation of washing and fixing, having become waterproof by the treatment with shellac.

I treat all the prints produced by single transfer, after becoming dry and having been "touched" or "spotted," if necessary, with a weak solution of shellac, like the above, but in which the albumen has been replaced by one-third its weight of glycerine. Such prints, after being rolled or burnished, have a sufficient polish, but if more be desired it can be obtained by polishing the prints with a little alcohol and linned oil, applied as in finishing French-polished furniture. Or the prints may be enamelled with collodion and glycerine, applied on the surface of a plate of glass, as is well understood.

Having thus described and particularly set forth the nature of the said invention, and the manner of carrying the same into effect, I would have it understood that—

I claim under the first improvement the use of alizarine lake formed by aluminas mixed with lime magnesia, or other earthy matter, capable of fixing the alizarine without rendering insoluble the gelatine when employed for pigment paper; and I claim the mode described for "toning" prints produced by such lake or lakes.

I claim under the second improvement the method of preparing the pigment paper by subjecting it to the temperature on a level surface as therein described.

I claim under the third improvement the use of cardboard made impermeable to water, and sheets of metal coated with prepared paper as the temporary support in obtaining a non-reversed proof by pigment printing.

I do not claim under the fourth improvement the use of transparent gelatine, but that only in which the gelatine has been made opaque to replace the more or less costly double transfer paper as therein described.

I claim under the fifth improvement the use of the well-known gelatine solution for the purpose therein described.

In the second division, or Chapter II., I claim under the first improvement the mode of transferring negatives described, simple or compound.

I claim under the second improvement in single transfer pigment printing the use of a card or board formed of two or more layers of paper cemented together as therein described, and the use of enamelled paper prepared with kaolin or starch, or with some equivalent substance which does not combine with the ingredients employed to form a stain on the whites of the picture.

I claim under the third improvement the use of thin paper prepared by immersion in the solution therein described,

THE PHOTOGRAPHIC EXHIBITION.

[From the ART JOURNAL.]

THIS Society is again holding its annual exhibition in the Gallery of the Water Colour Society, Pall Mall East, which is hung with about five hundred and forty examples of the art, including those displayed on the screens. It appears to us that during the last very few years photography has reached such a point of excellence, that to go beyond it is scarcely to be expected—is, indeed, simply impossible; and if the Society is unable to show that any strides have been made in a new direction since its last public exhibition, and if the increased skill and knowledge of our leading photographers have produced no novelties, it may at least be maintained that nothing has been lost. If, on looking round the Gallery we miss from its walls the rich and beautiful masses of colour the painters give us when the room is open in the months of the spring and summer, we have still the picturesque composition and the life-like individualities of nature, such as no human hand could trace out on canvas or paper, and side by side with the beauty of landscapes are individualities of another kind—in the "human face divine," either singly, or grouped in companionship with landscape, or engaged in occupations of various kinds.

The Royal Engineers' School of Photography at Chatham exhibits numerous exquisite examples of the art, conspicuous among which is "Woodland View, Deer Leap Wood," wherein the distant haze of a misty morning is marvellously expressed, softening, but not concealing, the objects whereon the subdued sunlight rests. Stillfried and Andersen, of Japan, contribute some very interesting specimens of the people and scenery of that far-off country. Colonel Stuart Wortley is, as usual with him, grand in his delineation of wave and cloud; wonderful "Studies" they are, in breadth of expression, variety and force of cloud-form, and in curve of ocean wave crowned with beams of sunshine, and rippling waters moving lazily out to sea and sparkling as they go. Some such scene as the latter is the pretty girl contemplating, whom Mr. R. Slingsby represents, under the title of "Alone," seated on a bench overlooking the sea: a most attractive picture in every way. "Studies of Children," by Mr. R. Paulkner, is a frame containing upwards of seventy pictures of little ones in almost every conceivable attitude and action: an amusing and pretty "portrait gallery." "Waiting to go on," by the honorary secretary of the Society, Mr. H. Baden Pritchard, is also an amusing picture: a child dressed in "motley" waiting the stage manager's summons before the curtain. Among several very charming landscapes by Mr. F. Beasley, we particularly notice two Devonshire scenes, "Ivy Bridge" and "Holy Street Mill." "Lissy" and "Elsie," by G. Newbitt, are two striking and spirited portraits; and his "Tired Companions," a noble dog and a young child sleeping together on the floor of a room, is a pretty subject treated with true artistic effect. H. P. Robinson, of Tunbridge Wells, contributes a most effective picture which he calls "When the Day's Work is Done," an aged couple seated in their cottage home, the man reading the Bible to his wife. If this be taken from life, it is a wonderful application of the artist's taste in arranging his materials, so skilfully and pictorially are they set out, and so efficiently is the whole produced. "Thunder and Lightning," exhibited by the Autotype Company, is from a painting by L. Cattermole, it shows a herd of horses alarmed by the storm, and careering about as if they were wild animals. The composition reminds one of Mdlle. Rosa Boubeur's "Horse Fair." "Bird Nesting," by A. Ford Smith, of Llandudno, presents to the spectator three or four young girls, in pretty walking costumes, searching for birds' nests among the shrubs and brambles of a wild-looking expanse of copee. A more attractive picture of its kind one can scarcely imagine. H. Pointer, of Brighton, famous for his amusing photographs of "Cat Life," has numerous specimens of these domestic animals. Mr. S. Thompson's architectural views of continental towns and cities could not be excelled.

Besides the photographs from Japan already noticed, there are specimens from F. Gutekunst, of Philadelphia; C. Klary, Algiers; B. Mischewski, Dantzic; Dr. Van Monckhoven, of Ghent; C. Rebas, Lisbon; Schu's and Sock, of Carlsruhe; Taaehler, of Schwarz in Switzerland; and L. W. Kenney, of New York, whose contributions to the Society testify to the interest felt by foreigners in its operations.

On the table in the Gallery are various objects connected with the practice of the art, stereoscopes, cameras, photographic albums, lantern slides, &c., exhibited by Messrs. Murray and Heath, G. Hare, and others.

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A rose, with its green leaves, was another subject of Mr. Cooper's experiments; perhaps few things would be more effective without presenting exceptional difficulties. A delicate blush rose would be well represented by the different depths of pink which would be given by a tissue containing a moderate proportion of carmine, or a similar coloured pigment with more permanency; and the leaves

and stem would be represented by a bright-yellowish green. It will be seen that none of the shadows in the petals of the rose itself will be so dark and transparent as to cause any danger of penetrating sufficiently deep to reach the green, whilst the stem and leaves being much more transparent in the negative, the green layer will be penetrated and give the gradations of the foliage in green. Some high lights on the leaves might be tolerably opaque in the negative, so, in points, only the pink layer would be penetrated by light which, in the finished print, would give a rose with gradations of pink in the bloom itself, gradations of yellowish-green in the foliage, tipped with rosy, high lights, a beautiful feature of many rose-leaves in nature. Such a print, if the specimen rose had been well chosen, the negative well taken, and the printing skilfully done, would possess a rare beauty, giving all the gradations of the flower in a very close approximation to their natural tints.

It will be seen that the plan in question might have various pretty applications. One feature in Mr. Johnson's new patent to which Mr. Cooper refers, gives practically two layers in the tissue, not different in colour, but different in delicacy, although of the same colour, so that the more delicate half tones and the pearly greys which surround high lights shall receive justice by being rendered by the most delicately tinted layer of tissue, whilst the deep blacks, requiring the robust stronger colour, will be rendered by the deeper layer of pigment. It will be possible also, in working out Mr. Cooper's plan, to secure two varied tints of monochrome, say, for portraits. We remember that when Mons. Adam Salomon's portraits first astonished English photographers, it was noticed that one element of richness was the cool grey of the half tones, whilst the shadows were of a rich deep warm tone. This quality can be secured in gold toning under certain conditions. By the use of a cool layer of cool grey and one of rosy black, a very fine effect might be secured in portraiture, as Mr. Cooper points out, although, as he also points out, the result may be secured better still by the method indicated in Mr. Johnson's specification, which we publish on another page. For special effects, and in experiments on a small scale, we once more recommend the plan suggested by Mr. Cooper in the PHOTOGRAPHIC NEWS for July 22nd, 1864.

PHOTOGRAPHY AND THE FORGING OF CHEQUES AND BANK-NOTES.

THE tinting of cheques and bank-notes, and the marking of them with fine designs, instead of rendering them incapable of reproduction by means of the camera and otherwise, appear rather to facilitate imitation than otherwise. Take, for instance, the fine type printed upon the Cheque Bank cheques. At first sight such a precaution as this might seem to the uninitiated a great safeguard. The whole surface of the cheque is covered with "The Cheque Bank, Limited, the Cheque Bank, Limited," &c., and in such small characters as hardly to be read by the naked eye. But what would be more easy than for a clever photographer to enlarge these words, to trace them over in black ink, and then reduce them again to the proper size upon a clear negative? And once the latter is obtained, an engraved plate could be produced in one way or another without difficulty. It would only be a question whether such a roundabout plan of proceeding is really necessary. The type, as we say, is so small, that if the words were not actually reproduced by photography from the original, it would be hard to find out the difference, supposing the words had been copied by hand with some exactness, and the copy afterwards reduced.

Most foreign bank-notes have microscopic type of this description upon them, setting forth that forgers are liable to so many years' transportation. This small type, indeed, has been regarded for a long time past as a special

safeguard, and so it might have been before the days of photography. But capable forgers would find this type more easy to imitate now-a-days than the rest of the document, and those, therefore, who are used to telling a good note from a bad one by these means would find themselves deceived.

Again, in the case of tinted cheques. There are many methods known to chemists by which colours may be bleached, and then the cheque is easily copied. The engraving of a reproduction need not be so very good if it is to be covered with a tint, and hence the latter sometimes supplies actually the means of forging. A German photographer recently told us in these columns how it was possible to copy even tinted cheques in case colour cannot be got rid of. The blue ordinarily employed upon the French bank-notes appears remarkably easy of removal, and it was but the other day that a photographic plate was seized in Paris, upon which no trace of blue of the original could be found.

Colours, therefore, from the fact that they cover up imperfections in the forged plate, are rather favourable to the forger than otherwise, we would ask bankers to bear in mind. It is a singular fact, indeed, that the white and black bank-note of England, although it is usually a more valuable document than the notes of other British and foreign banks, is very rarely forged, since the paper-mark, and the engraving thereof, present difficulties which are not met with upon other complicatedly coloured productions. Thus, it would seem that after all, the best safeguard against forgery is to be found in finely-executed engraving upon a carefully water-marked paper.

PHOTO-COLLOTYPE PICTURES IN COLOUR.

MONS. LEON VIDAL'S perfect examples of photography in colours, consisting of chromo-lithography and carbou printing combined, have attracted much attention in Paris and elsewhere. A new form of chromo-heliotype is described by Dr. Vogel in our Philadelphia contemporary. Referring to an exhibition at Nuremberg, which consisted chiefly of the multiplying arts amongst which photography and photo-mechanical printing processes stand pre-eminent, says:—

Lichtdruck predominated to such an extent that all other articles of exhibition had to stand back. Something new and of an interesting kind was noticed in this line, namely, Lichtdruck in colours—chromos not produced by means of lithography, but by means of Lichtdruck; and this was so much the more interesting on account of two different methods, one of Obernetter and the other of Albert, who both sent articles to the exhibitions. Obernetter's chromo-heliotypes are manufactured in a plain manner. Suppose a rose on a green stem was required to be made in colour. First, three negatives would have to be reproduced from the original negative of the rose by means of Obernetter's dust process. In one negative all parts are to be covered except the green leaves, and from this negative a Lichtdruck plate is to be prepared, with which the leaves are to be printed in green colour. In the second negative all is to be covered except the rose, the plate to be made and the rose printed in red; in the third plate, all covered except the background, which is to be printed in a colour harmonizing with the subject from the last plate taken. Obernetter reproduced in this manner works of art, such as malachite vases, bronze articles, &c., which were very effective. Albert's helio-chromos are entirely different. They show a greater richness in the tones of colours. He manufactures them in the same manner that Ducos du Hauron published four years ago. Suppose there are three squares, one blue, one yellow, and one red; if we take them with common collodion the blue square will show only an effect which, after long exposure, appears as non-transparent in the negative as a white background. If we produce from such a plate a Lichtdruck plate, then the strongly covered blue appears but lightly,

while the yellow and red squares are strong. Thus we receive a plate which can be printed in yellow and red colours. But if we make the collodion sensitive for yellow beans by means of the addition of anilin red, in the manner I have shown formerly, then by means of photography the red square only remains transparent, and the resulting negative produces a Lichtdruck plate which is to be printed in red. We can make, also, a plate in which the red and yellow have a strong effect by making the collodion sensitive for red and yellow by means of adding anilin colours, and excluding the blue colour photographing the subject through a yellow glass. Thus we receive a negative which produces printing plates for blue. If we wish to obtain a printing plate for yellow colour, we must work with pure collodion, which is sensitive for all colours but yellow. Thus Albert obtains plates for three primitive colours, red, yellow, and blue, and can print them with suitably selected pigments. Of course the selection of colours depends again on the taste of the printer, and in that direction we have nothing to do with the natural colours which are photographed, but only with negatives producing in the photographic way suitable plates for printing in colours. Anyhow, it requires great carefulness in selecting the collodion, and the coloured glasses through which the negatives are taken. For every object they are to be taken differently. The specimens exhibited by Albert are very promising, although it must be admitted that the colours are not quite the same as in the originals.

Besides these specimens, the Nuremberg exhibition shows many other things of interest. There are a number of block-prints, manufactured in a very plain manner, by Grienwald, at Bremen. He takes a collodion positive in line, copies the same on a chromo-gelatine film which lies on glass, and washes it in hot water, after which the black lines of the positive remain deepened on the gelatine film. This relief is cast in plaster of Paris, from which a wax mould is made, and then a metal plate taken by means of galvanoplastic. The clichés thus secured do not answer for strong artistic requirements, but are entirely sufficient for technical drawings, illustrations, and labels.

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The imperial printing establishment at Berlin exhibits very fine heliographs. Their glass prints especially attracted attention. The manufacturing of the same is no longer a secret. A negative of sufficient strength, and by means of an albumen coating, is made to adhere rigidly to the glass, is covered, instead of being varnished, with a thin coating of chrome-gelatine, and exposed from the back. The gelatine parts under the transparent lines, and thus becomes insoluble and sensitive for fatty black ink. If we wash the plate and ink it with the roller, the ink will adhere at the lined places. We can make only a few impressions from such plates, but it is possible to transfer a copy on stone, and then to print the picture from that. Another process of the imperial printing establishment is to cover the negative with chrome-gelatine, and expose it from the back a long time, after which the unchanged gelatine is washed off with hot water. Then the lines remain in strong relief, and by means of graphite the plate can be prepared for the galvanoplastic apparatus to take a cliché. Thus we receive a copper plate which produces beautiful impressions.

The Photographic News.

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Besides this process of printing, there was exhibited the Woodbury print. In Germany this process is made use of by Bruckman, at Munich, and Brann, at Dornach. The latter also introduced recently the Lichtdruck in his establishment, and is publishing by means of this process the hand-drawings of the old masters. The photo-chromic process of Vidal was also exhibited, but with only a little effect. In pigment print the exhibition showed many specimens, although the carbon process in Germany has not succeeded so far.

THE ARTIST PHOTOGRAPHER.

BY W. HEIGHWAY.

Do you think you are an artist, just because you daub "Artist Photographer" over your door, and have it printed on your cards?

Well, perhaps you have as much claim to the title as the hundreds who rejoice in it without appreciating its value and its responsibilities.

Responsibilities? Yes, responsibilities! because the artist is a teacher, an educator; and if you claim the professorship before you have even learned your letters, how bewildered must be your pupils!

The photographer's lessons are—or, rather, should I say, *ought to be*?—in every photograph he sends out; his pupils are those who look upon his work. Regarded from this point of view, how disappointing is photography, how much individual workers have to answer for in caricatures they have perpetrated on the beauties of Nature, how utterly ridiculous they have made their work, what marvellous falsehoods they have made the camera tell!

A little time back, when vulgar honesty was more common than it is now, the individual who stuck the sitter in a chair in a wonderfully wooden position, or placed him awkwardly up against a column in an attitude the most clumsily-made lay figure would be ashamed of, used to laugh to scorn the idea of art work.

Well, it was honest, if the expression of it was coarse. The idea of his being an artist was absurd. True, it was!

But times are wonderfully changed.

Everybody is an artist now. We have the artist clothier, and coats were, perhaps, never worse out than they are now-a-days; the bootmaker whose shoes lame you, styles himself an artist; the hairdresser tries to reconcile you to having your locks vilely shorn, and to allay the annoyance of finding you cannot prevent the little hair left on your head from standing upright in horror at the outrage, by giving you the consolation of the consideration that it has been done by an artist; abominations in furniture, neither useful nor ornamental; house decoration wanting in taste, meaning, and beauty, is all artistic; and last, and most outrageous, we have photographic artists!

The slopper in chemicals, without one single idea of beauty, without the faintest instinct of colour or composition, without even the appreciation of or love for art, now in all his glorious grime of silver and iron claims to be regarded as an artist-photographer.

Well, it is not to be helped, I suppose. We must make the best of it. Stay! I will make my peace with the hundreds of indignant artists, who, quivering with their sense of the outrage I have committed on them, and snorting with rage at the indignity I have worked, would tear me in pieces—I will try to soothe their ruffled pride by saying it is not ill that they claim the artistic title.

It at least betokens an awakening to the knowledge that photography is susceptible to artistic treatment—that an alliance is possible—but the claim must be made good.

Let us really be artists and it will matter very little what is put over the door—indeed, whether anything be placed there at all; it will be of quite secondary importance what legend your card bears: the public, fast

becoming very decent critics, will soon recognize and reward your excellence.

Has it ever struck any of you how very bad, from an artistic point of view, your work really is? Do you feel how hopeless it seems to produce a picture?

Yes? Then by no means despond. Those very convictions are as hopeful as the sense to the convalescent of how ill and weak he feels when his danger is over—when he is, in fact, *well enough to feel ill*.

When the photographer begins to doubt the excellence of his own productions, it is because he recognizes in those of others superior qualities, and the mere fact that he perceives this is a grand thing.

Perception is the most precious sense to the photographer, and, perhaps, the rarest. It seems to me to be naturally largely bestowed, or the child would never be able to communicate with the world into which it is born; but, neglected, as other modes of gaining knowledge are acquired, the human animal almost loses it; where, however, the sense survives, or is developed, the possessor is a genius.

The average photographer, though he cannot expect to claim genius—though there is no knowing what he may claim—may yet educate his eye and mind by studying the works of genius, and, with a knowledge of the rules of art, improve on his work, and even place it in a really artistic position.

Study well the human form divine, but that alone will not suffice: you must also study how it has been put on paper and canvas by the great painters. Just as you are not likely, without the aid of books, to know much of geology by digging into the earth though you go miles down, or geography if you sail to all parts of the globe, so it would be of little profit to confine yourself to the study of nature to become an artist.

You must read the canvasses of the great teachers, and then you will begin to appreciate nature.

There is lots of art possible in photography, whatever its detractors may say. The great thing is to make its professors believe so, and, once awakened, I am sure they have enough energy and skill to make the fact patent to the world.

Photography has its limits, but they have not been bounded yet, and there are still acres of unbroken ground. When you have reached the perfection of the attained you will begin to believe that there are possibilities beyond to be had for the striving. That doughty spirit of the old captains, who had faith that if they sailed far enough they would reach land at last, is the kind of will to work with. The photographer has his lands, known and unknown, to conquer.

First learn to traverse that already mapped out by many earnest and skilful explorers, and you may then begin in the work of discovery yourself.

ARTISTIC LIGHTING AND THE GENRE CALLED REMBRANDT

BY M. SCOTELLARI.

In the year 1871 I paid my first visit to Great Britain to introduce my special manner of lighting called genre Rembrandt. At my second visit I find that a greater number of photographers seem not to realize to themselves a very precise idea of the real effects which result from a right distribution of light in a studio.

Photographers pledged to make progress will find, I am sure, the satisfaction and benefit which they may expect in employing conscientiously the theories described, the result of serious inquiries in scientific and artistic branches.

Indeed, operators place the model generally too near to the background, and dispose of curtains on both sides of the model. This is a great error. The model lighted only in front receives evidently the light in plain face, and

thence follows the absence of modelling in the picture, abrupt (brusques) transitions of the lighted parts to the slightly lighted or non-illuminated ones; that is to say, they have black shadows and chalky lights without relief, and in place of being well modelled, the print becomes of course white and flat.

Things being so, a careful operator studies to obtain a transparent negative which seems to him better modelled, but which finally gives only a factitious modelling, forced in printing, and unfavourable to the model, without life or expression, lacking all real delicacy. Such are the grave imperfections I want to rectify by the popularization of the method called Rembrandt, which I have the pleasure to submit to the appreciation of the members of the photographic art in the present description—a proceeding of such a very simple application that the first photographic prints will show its superiority by the excellency of its results, diametrically opposite to those obtained previously, in giving living portraits, with fine relief, depth of shadows, gradation of tints, and the transparent fineness of the rendering of flesh.

The Studio.—All studios should be furnished with moveable curtains to use for regulating the light according to the operator's will, and to distribute it in the following manner:—The upper glazed side, giving the top light, should be divided into two parts, the shadow, and the light side. A dark violet curtain covers the first, a bright violet curtain the second side. The curtains will allow the operator to light or shade, at pleasure, the model, in case the light should be not active enough, or too active.

The glazed side of the studio, where the full light enters, must be furnished with a moveable bright violet curtain, which can be advanced or retired if wanted. There should only be employed grey carpets of a brighter or deeper colour, to avoid reflections which could alter the operation of the light.

The background should be in preference of a deeper colour, by putting at the side where the model is chiefly lighted, part of a background screen, so that it projects a penumbra or slight shadow, which grades off and terminates near the middle of the background of the picture, and causes an effect equal to a circular background.

In case, by any reason, the fixing or the furnishing with curtains in the studio be inconvenient, there can be placed as a substitute above the model a violet screen (or a violet sunshade) to shade the model according to the effect desired.

COLLODIO-CHLORIDE PAPER.*

SOME portraits upon this paper which we have seen recently, and which excited not only our admiration, but that of many photographers, have induced us to lay before the readers of this paper the process by which collodio-chloride paper is prepared at the present day. In making this paper a substratum is necessary upon which the sensitive film can be spread; this substratum is made in the manner following:—

A solution of good white gelatine is first of all prepared; the white of twenty eggs is next beaten to a froth, the same being cleared by standing. Equal quantities of the two solutions are then intimately mixed together, the temperature being slightly warmed. To this solution is added some baryta white, which is gradually stirred in until the mixture has assumed the consistence of a syrup. Some finely powdered asbestos is next added (about one-sixth of the baryta employed), and finally to the whole is added a solution of one and a-half grammes of citric acid in fifteen grammes of water.

This mixture is applied as uniformly as possible by the aid of a broad camel's hair brush to ordinary unprepared Saxe or Rive paper. A badger hair brush permits of the coating being subsequently equalised. The sheet when

dry is coated a second time, allowed to dry once more, and then well pressed. Every sheet is next brushed over with a stiff brush, until a high and uniform gloss has been obtained, the surface being afterwards rolled to make it yet more smooth.

Prepared in this manner the sheets of paper have a beautiful white polish, such as no albumenized paper can boast. The pictures have an elegant enamelled appearance, and leave nothing to be desired on the score of softness and delicacy.

The collodio-chloride employed for the paper differs very materially from that usually used for glass positives. The only important point is, that in this case two collodions are required of different sensitiveness, which, by being mixed together, exhibit that vigour and softness combined which are the characteristics of collodio-chloride prints.

Collodion No. 1.

Normal collodion (2 to 3 per cent. of pyroxyline) ...	600 grammes
Chloride of magnesium ...	45 "

To this chlorised collodion is added the undermentioned solution:—

Nitrate of silver... ..	11 grammes
Water	16 "
Alcohol	16 "

The nitrate crystals are, in the first place, dissolved in the water, and then the alcohol is added, drop by drop, the liquid being well shaken the while; afterwards the latter is gradually added to chloride of magnesium collodion.

The turbid milky collodion thus produced is next treated with the following solution, when it stands ready for use, namely:

Citric acid	4 grammes
Water	8 "
Alcohol	8 "

This collodion is capable of being kept for weeks in good condition.

Collodion No. 2.

Normal collodion	625 grammes
Chloride of magnesium ...	3.75 "

To this is added a solution made up of:—

Nitrate of silver	16 grammes
Water	16 "
Alcohol... ..	16 "

and afterwards a citric acid solution composed as above.

Both collodions are permitted to stand a few days in the dark; they are then decanted from any precipitate that may have formed, and mixed together; they are then in a condition proper for use.

The application of the collodion to the enamelled paper is done in the simplest way by pinning a sheet upon a flat board, and treating it as if it were a glass plate.

(To be continued.)

Correspondence.

BERLIN PHOTOGRAPHIC SOCIETY.

DEAR SIR,—Often, when perusing your contemporary, I find, under the above-mentioned heading, reports of meetings of a photographic society held in our town. Now you will please to take notice that there is some mistake if you think that there is but one Photographic Society in Berlin. There are two: *Verein für Förderung der Photographie* (Society for Advancement of Photography), and then the *Photographische Verein für Berlin*, which is to be translated: Berlin Photographic Society. This latter Society, of which I have the honour to be a member, having, since the death of *Licht* been without an organ

* *Photographische Wochenblatt.*

could, of course, not produce great effect in the world, and was for that reason little known. But now that my *Photographisches Wochenblatt* has been elected the organ of this Society, and several meetings have already been held this winter, a fresh spirit has come into our Society, the members of which are daily increasing in number.

You will kindly allow me to give you a report* of our last meeting, by which you will see that our Society is flourishing, and will soon constitute one of the most considerable photographic societies in Germany.—Yours truly,

ERNEST DUNY.

Secretary to the Berlin Photographische Verein.
Berlin, November 20th.

TWO LAYERS OF PIGMENTED GELATINE IN CARBON TISSUE.

SIR,—The announcement of Mr. Johnson's recent improvements in carbon printing has given me great satisfaction, though I must also confess to a slight feeling of disappointment at finding myself forestalled. However, these coincidences are so common in photography one ceases to be astonished at them. For some time past I have been working in a similar direction, and the state of my health has alone prevented me from publicly ventilating the subject earlier.

I had satisfied myself months ago that the method of coating the developed print with opaque or translucent gelatine was a good one, and intended adopting it for all my future small work. As to the other grand point in Mr. Johnson's specification, I have for a long while been thoroughly convinced we should never get a perfect carbon print until our tissues contained either a graduated film, or two or more layers of gelatine containing a different amount of pigment. With the ordinary homogeneously prepared tissues I have quite failed in rendering the delicate atmospheric effects in some of my landscape negatives. The tissue, which apparently perfectly registered every gradation in a portrait, proved quite inadequate when used for a delicate sky. The thinnest layer of the coloured gelatine which it is possible to obtain is too thick (or, rather, contains too much colour) to render the faint tones which we ought to get in a good sky picture, and which we do see in a first-rate silver print.

It must have occurred to many thoughtful workers that the only way out of the difficulty is to have a coating of very slightly coloured gelatine on the surface of the tissue, so that the most delicate half tones might be rendered by it, whilst the more forcible tones would be represented by the more strongly gelatinized below.

In the very early days of carbon printing I worked out a method by which prints in two or more colours were produced by using superimposed layers of variously coloured gelatine, and it had often occurred to me since that some modification of my early method would be useful for the more perfect rendering of a negative in monochrome.

The curious in such matters may find a short article from me on the subject in the photographic journals for July 22, 1864; but if Mr. Johnson's new method of preparing tissue be practical on a large scale, it presents some points of superiority over the plan of using more coatings than one of gelatine.

From Mr. Johnson's proposed method of preparation it will be noticed that (theoretically) we obtain a gelatine plan containing a perfect *gradation* from the finest to the coarsest particles of colour, instead of having definite layers, which will doubtless be a very great advantage.

The superiority in this way of Mr. Johnson's plan must be so patent to every one that I need not enlarge upon it; and I am pleased to take this opportunity of congratulating Mr. Johnson on the great step in advance which he has just made.

In concluding, I would, however, suggest that the plan

* See *PROCEEDINGS*, page 675.

of successively coating the paper with two or more layers of gelatine might also be useful. It would enable us to have the tints altered, as well as the amount and quality of the pigment.

For some subjects a fine effect would be produced by having the half tones of a cool tint, whilst the deep shadows might be enforced by a warmer colour—or *vice versa*.

Whilst engaged in experiments on *Wothlytype* printing I obtained many pictures in which this effect was produced, and it is so effective that I should be glad if we had the means of imitating it in a more permanent process.—Believe me, yours sincerely,

HENRY COOPER.

Honshurst, Thurpay, November 23rd.

THE LATE EXHIBITION.—INJURY TO PICTURES.

SIR,—In addition to the complaints of "Critic" and "A Grumbler," will you allow me to call attention to the shameful manner in which the pictures are packed (?) for return to their owners. I sent several pictures of large size, with new gilt frames, very carefully packed by putting two frames together, face to face, with thicknesses of paper between each, so that they should not be scratched or injured, and then wrapped each pair of frames in large sheets of paper, completely enveloping them, and, of course, tied them carefully, and securely placed them in a strong case. When they came back they were sent in a most slovenly way, only a thin piece of paper put between each pair of frames; they were not tied together, neither were they wrapped in the paper sent for that purpose. The consequence is, the gilt frames are much scratched, and one glass thirty by twenty-two is broken; also one of the pictures is so scratched as to be quite unsaleable, and its mount destroyed; altogether, injury to about £1 is done. I consider it a good deal too bad that exhibitors should be thus served. It is a good bit of trouble and expense for country exhibitors, one hundred or two hundred miles away, to send pictures (especially large ones) to London, and if they arrive in good condition, as I know mine did, with all the materials requisite for being securely repacked, those materials should be used, and care taken, so that the pictures may arrive at their owners in good condition; as it is, they appear to be left to subordinates, who pack them anyhow, anxious, I suppose, only to get them off their hands, and caring not whether they arrive home all smashed or not, and it seems that the packing materials are either wasted or appropriated to other uses.

The great ones of these exhibitions should understand that many a battle has been lost by neglecting the little details, and if exhibitors' works are to be cast out of their synagogues as useless rubbish the moment the managers are done with them, they are not likely to entrust them to their tender mercies a second time.—I am, yours truly,

AN EXHIBITOR.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual supper of this Society came off in the Albert Hotel, on the evening of Wednesday, the 14th instant, Dr. SIDAY, one of the Vice-Presidents, in the chair, and Mr. W. H. DAVIES, croupier.

The attendance was good, and included a larger amount of musical and histrionic talent than usual, and consequently the evening was one of the happiest that has yet been spent in connection with the Society.

On the evening of Friday, the 16th inst., a special meeting was held in the usual place, to witness an exhibition by Mr. York, of London, of Keovil's patent lantern. It was originally intended that Mr. York should have been present himself, when, as he has for several years been very liberal to the Society in supplying transparencies for the popular evenings, he should have received a hearty Scotch welcome. Business engagements, however, pre-

vented his coming, and the exhibition was conducted by his representative.

The apparatus, which on this occasion included Young's patent oxygen generator, was very compact and portable, and consequently very suitable for a travelling lecturer. The general arrangements of the lantern were much admired, especially the method by which the dissolving effect was produced. The image produced by the prismatic lens, although as brilliant, if not more so than that produced by the direct lens, was, to a certain extent, wanting in definition, but the exhibitor explained that an alteration had been made by which that defect was entirely overcome, although, unfortunately, it had not reached Edinburgh in time for the exhibition.

The general impression of those present seemed to be that when the improvement had been made, the lantern would be a decided acquisition to all who are interested in dissolving view exhibitions.

BERLIN PHOTOGRAPHIC SOCIETY.

A MEETING was held on the 1st inst., O. BRASCH, Esq., in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. ERNEST DUBY showed some prints directly taken by the roller and greasy ink from the negative, together with the printing-frame, and fully explained the manner of proceeding.* A strong glass plate is coated with albumen, then collodionised with a particular collodion,† then sensitised, exposed, and fixed as usual, whereupon some hot water is poured on it such as to keep it a little warm. Meanwhile is prepared a solution of Nelson's gelatine in water, to which are added a few drops of a saturated solution of bichromate of ammonia, and this whole mixture is to be extended on the warm negatives, after which it is allowed to dry, but *horizontally*. This done, let the light work on it from behind, then wash it out with warm water, when it will be ready to be inked by means of the roller—the ink must be of a particular composition.‡

Mr. ERNEST DUBY afterwards showed another specimen of printing which he had done in the following manner. Of a negative, a carbon copy had been taken, then transferred on a clean and finely-polished copper-plate, developed, made conductible for the galvanic fluid, and then a copper-cliché was taken from it. From this cliché a good number of copies could be made on common paper.

In the prints and blocks exhibited, and the explanations of Mr. E. DUBY, the members took great interest.

Mr. C. BRASCH exhibited a collection of copies that had been made by Mr. F. WILDE, photographer at Götting, by means of his emulsion dry process. The audience unanimously agreed that among all dry processes known and used hitherto, that of Mr. WILDE was the best. The prints he had sent in, some landscapes taken in the Riesengebirge, were declared to be first-rate work, and moreover it was stated that between these copies, and such as are obtained by the common wet process, there was no difference in respect to their beauty and artistic value.

Mr. CARL SUCK produced some fine diapositives in carbon printing, representing landscape and architectural work. In every one of them he had printed clouds in the most delicate and beautiful manner, and these clouds gave to the whole a particularly charming appearance.

M. HERMANN SCHWABELI had made some instantaneous views of steeple-chases and runnings, of which, with a good deal of retouching, he had made enlargements that were recognised to be first-class work.

On one occasion, the attention of the audience having been turned to the so-called dry-spots (Trockenflecke), a discussion took place with regard to the different methods of avoiding this evil. It was agreed that covering the back of the negative with some wet paper, or hanging some wet paper close over the camera, was far from removing the annoyance, rather making it increase.

One of the members, Mr. GERCKE, stated that carefully rubbing the back of the plate before putting the same into the cover was an excellent thing for making these spots appear late.

* As I promised you in my last correspondence, you shall have a faithful report of several practical printing methods, among which there will also be the Negativ-Druck (direct printing from the negative), and therefore I now give you but an extract of the whole process.—E. DUBY.

† Our correspondent promises the process, with further explanations.—Ed. F.N.

Mr. STAFFORD said that he always poured some sulphuric acid into the developer, which he has found to be very good.

Mr. THOMAS POOR stated that in order to make these spots transparent, so as to work afterwards against them, with negative retouching, he had pencilled them with a solution of iodide, and afterwards taken them off with cyanide of potassium.

Mr. BRAUN and Co., in Dornach, sent in a beautiful collection of carbon prints. Amongst them were reproductions out of the galleries of the Luxembourg, the Louvre, the Vatican, the Hague and Amsterdam, Swiss Views (The Rickenbachfalle), the Dome of Milan, and several others. All these prints were examined with the greatest admiration, and it was resolved to send to Messrs. Braun and Co., at Dornach, a vote of thanks for their kindness in sending them. E. DUB Y.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The Annual Meeting of this Society, for the election of officers and other matters of business, will take place next Thursday, December 6th, in the rooms of the Society of Arts, Adelphi.

HORRORS PHOTOGRAPHED.—We have before us, says the *Morning Post*, a series of thirty photographs which have been made by order of the Turkish Government of victims and groups of victims, survivors of the late outrages in the districts of Yendi Zaghra, Kessalik, &c. They consisted chiefly of women and children, and the photographs display the sword gashes, lance thrusts, and bullet wounds which these unfortunates have received. One poor young married woman, Edibe, twenty years old, of Djainbasid, who had her child, aged sixteen days, killed in her arms, was wounded with two bullets after having been thrice outraged. She has been taken into the house of Madame Camara, a lady who seems to be most active in all charitable deeds, and whose kind face we meet in a photograph with a little wounded orphan in her arms. A girl named Fatima bends her head to show a severe cut. Some poor children have lost eyes or fingers. Some women have had their arms cut off, such as Elif, twenty-five years old, of Tekke, who displays this mutilation and a horrible head wound. Lobibe and Ahmed are two little boys, aged three and five years respectively. The youngest has a fearful gash across his face; the eldest two sabre cuts in the head. A mother of three children, named Lemine, of Haidur Bey, has dangerous wounds in the thigh and stomach. Two other orphans, their parents massacred, have most ghastly wounds on their poor little bodies. Their ages are not stated, but apparently they are three or four years old. One wretch, a man, has four bullets in one leg and two in the other; and there is no lack of these sad proofs of massacre. Many mothers have their injured infants in their arms, and their faces show traces of the sufferings they have gone through rather than any gladness at their escape from the death which overtook their relatives and friends. One group consists of a child, mother, and grandmother; the child is wounded in the head and forehead, the mother has received several blows with a knife on the head, while the grandmother was wounded in the back. Nothing can be more painful to look upon than the long series, of which we have noticed a few. These horrors have been perpetrated within the range of the martial law of the "liberating" forces of Russia, yet not a suggestion has been made that their authors should be punished. Ferocious vengeance, stirred up by such deeds, has been taken sometimes by irregulars or lawless bands upon those whom they regard as the authors of the crimes. We deplore the fact that this should be so, but, however unjustifiable may be these reprisals, it is surprising that Europe should raise a cry against the decapitation of soldiers, an atrocity which was never remonstrated against when habitually carried on by the Montenegrins, and shut its eyes to the wholesale massacres of women and children. What cruelty, what abomination, what bloodshed, are attributable to the authors of this war!

MORTUARY PHOTOGRAPHY.—*Mayfair* says:—"Certain country photographers, improving on the hint of their London brethren, have turned their attention to the tombs; but instead of taking pictures of obituary notices, they are endeavouring to do business with the bereaved by forwarding—upon approval—copies of the inscriptions on gravestones."

HINTS ABOUT GLUE.—Good glue should be a light brown colour, semi-transparent, and free from waves or cloudy lines. Glue loses much of its strength by frequent re-melting; therefore, glue which is newly made is preferable to that which has been re-boiled. The hotter the glue the more force it will exert

In keeping the joined parts glued together. In all large and long joints it should be applied immediately after boiling. Apply pressure until it is set or hardened.

PARISIAN COPYING INK.—The best kind of copying inks are, as is well known, prepared by adding a percentage of alum, sugar, and glycerine, or salt, to the extract of logwood. Such inks have a violet tint, and gradually become blacker on paper. The copy is, however, very pale at first, and is often indistinct. The Parisian copying ink is distinguished from the common kinds by its appearance, more or less yellow in a liquid state, and by producing a distinct bluish black on paper. It has the additional advantage of preserving its fluidity, while the common kinds soon thicken. Professor Giint recommends the following method of preparing an ink which has all the advantages of the Parisian: A strong solution of logwood extract is treated with one per cent of alum, and then with as much lime water, so that a permanent precipitate is formed. Some drops of weak chloride of lime are then added, so that a perceptible bluish-black colour is attained, and hydrochloric acid is added by drops till a red solution is obtained. A little gum is then added with 0.5 per cent, of glycerine.—*Paper Trade Journal*.

TEST FOR THE PRESENCE OF GOLD IN SOLUTIONS.—Protosulphate of iron gives a brown precipitate, which acquires a metallic lustre when rubbed. Protochloride of tin gives a purple or blackish precipitate, insoluble in muriatic acid. Sulphuretted hydrogen and hydrosulphuret of ammonia give a black precipitate, insoluble in simple acids. Ammonia gives a reddish-yellow precipitate (fulminating gold) with tolerably concentrated solutions, either at once, or on boiling the liquid. Liquor of potassa gives, with neutral solutions of gold, a similar precipitate to that formed by ammonia, insoluble in excess.—*Scientific American*.

To Correspondents.

CAMERERUS.—The loose fog of which you complain is by no means an uncommon trouble. It may proceed from various causes, and be at times prevented by various remedies. At times, correcting the bath by the addition of a trace of nitric acid will serve. One troublesome cause which we have found produce such fog was impurity in the acetic acid used in the developer, and changing for a pure sample of acetic acid proved a cure. We have also found that at times the use of a developer which has been mixed a few days, in place of a newly-mixed one, answered the purpose. The fault, as you will see, is due to an over-ready reduction of the free nitrate on the plate.

ONE WHO WISHES TO KNOW THE REASON.—The mere addition of water to your bath would not remove excess of iodide, nor would it necessarily produce a precipitate. Any addition of water to a properly iodised bath, as well as to an over-iodised one, would cause turbidity, but not necessarily a precipitate. To remove excess of iodide by addition of water requires great care, and some skill. The best plan to proceed is as follows: Take pure water of double the bulk of the bath, then pour the bath into the water, and proceed to filter. Afterwards add sufficient silver to make up the strength. But it is quite possible the pinholes may arise from other causes; possibly it may arise from the presence of sulphate of silver, in which case the addition of nitrate of baryta will prove a cure. Try the addition of two or three grains of nitrate of baryta for each ounce of solution, and filter. You should read carefully the papers and discussion on the subject at the meetings of the Photographic Society reported in the *News* in the earlier part of the year.

W. G.—Platinum toning gives not a warm tone, but a cold grey or black tone. To secure satisfactory toning conditions, it is necessary first to neutralise a solution with carbonate of soda, and then produce an acid reaction by the addition of a trace of nitric acid. 2. We do not understand your question in which you ask "What is the best developer for the above?" There is no developer used for a toning bath. 3. The second week in December.

J. W. C.—Monckhoven's "Photographic Optics," published by Hardwick, is the most likely book to suit your purpose.

H. FORSTY.—Mr. Mudd's little pamphlet on the Collodio-Albumen Process was issued by Messrs. Piper and Carter, the Publishers of the *News*, who will forward it on receipt of 1s. 1d. You do not state whether your transparent patches occur in the middle or at the edges of the plates. Such stains often arise at the edges from the fingers coming into contact with the film.

R. J. KEATE.—As a stereo lens for portrait and landscape purposes, D will, we think, answer your purpose. It is excellent for either purpose.

THANKS.—No. 2 will work well, and answer your purpose. It will give fine portraits, but will not be quite as rapid as a portrait lens.

E. F. (Streatham).—We have published many formulae for the photo-lithographic transfer paper. Here is one which appeared in a very excellent practical article by Mr. Butler, in our *Year-Book* for 1867. 3 ounces of Nelson's opaque gelatine in 40 ounces of water, dissolved by heat, 2 ounces of bichromate of potash in 10 ounces of hot water, thin, tough, writing paper is floated on this for seven or eight minutes, then hung up to dry, and the operation repeated a second time.

HORSFILL.—We regret to say that such cases are not altogether uncommon with other persons in the same occupation; and we have often before been asked if we could not aid in securing some redress. It is a matter in which, however, we are quite powerless. Any efficient remedy must be found, we fear, in applying to a solicitor. The simplest plan would be first of all to send some one to call and insist personally on a restoration of the effects. In anything we could write, to have any pressure, we must mention names, by which we should subject ourselves to the law of libel.

W. E. S. (Coventry).—It entirely depends upon how the touching-up is effected. If in water colours, then nothing better than gum. We cannot recommend lenses by name in these pages without unfairness. If you indicate a few by letters or figures, we can say which will be best for a special purpose by referring to the letters or figures.

OLD SLA.—The best mode of enlarging consists in producing an enlarged negative by the methods we have often described during the last three or four years. From such a negative you can print on albumenized paper, or plain paper, or drawing paper. You will find instructions for the latter in our recent *Year-Books*. The details would be too lengthy to repeat in this column.

J. WATKINS.—You must use a little judgment in regulating the time to suit variation in temperature. In warm weather, probably a couple of minutes; in cold, four. There should be no precipitate or turbidity in the toning bath, such turbidity would generally suggest decomposition and uselessness. If yours is turbid, state how you made it, and when it became turbid.

PORTLATA.—The best method in which we can help you with advice as to selection will be by mention which figure or initial of a series you may send attached to names and articles will best answer your purpose, as we cannot recommend articles or makers by name in this column. The process you mention promises well, but experience is too limited in regard to it to enable us to recommend it for your purpose. The coffee process, as described in our last *Year-Book*, produces very fine results, and is very simple.

W. M. PHILLIPS.—We have not heard of the difficulty of blistering as especially due to durable sensitive paper, nor have we found it so. Blistering is a very common trouble with many samples of paper, especially highly albumenized samples, and many remedies have been proposed, of which the most effectual seems to be the immersion of the print in alcohol before fixation.

A. E. S.—We do not imagine that anyone would attempt to filter glue, on account of its viscous condition, which renders the operation almost impossible. F. In ordinary transparencies, it is not necessary to get rid of the chloride of silver. For enamels it is necessary, and is effected by means of ammonia. G. Dextrine is used at the back of postage stamps. 4. There are several modes of photographing on ivory, which we have given in detail both in the *News* and *Year-Books*. It would be impossible to do so in this column. E. We believe Houch will supply one. L. We have not seen it, and cannot tell precisely to what you refer. Toning in daylight will often produce a pink tint, from a general reduction of gold. It is a defect.

MARINA.—The following is said to be an excellent receipt for roller making:—

Cooper's No. 1 glue	...	...	...	2 lbs.
Barder's glue	...	...	...	2 "
Best molasses	...	...	...	1 gallon
Glycerine	...	...	...	1 pint.

For winter reduce glue about $\frac{1}{2}$ lb. The glue should be soaked (wrapped up separately in woollen cloths) until the pieces bend easily without snapping, which will be in from two to three hours. Boil the molasses for about fifty minutes, and, after skimming well, add the glue, drain off superfluous water, and boil the whole for about twenty minutes. Put in the glycerine last, boil for three or four minutes (stirring the while), and pour off. The Durable Roller Company, of Farringdon Street, supply a patented article which is exceedingly durable and unaffected by change of temperature.

A CONTINENTAL SUBSCRIBER.—Thanks. We will make note of the information.

R. SLINGSBY.—Thanks. The prints are very interesting. We shall probably refer to them shortly.

C. J. WITCOMB, SCOTELLARI, DR. VAN MONCKHOVEN; ALFRED HUONER.—Thanks.

G. GREGORY.—We had not forgotten. Many thanks.

R. MANNERS GARDON.—We will write.

LIEUT. J. GROVE BLACK.—The letter is forwarded.

Several Correspondents Received.—Thanks.

Several Correspondents in our next.

The Photographic News, December 7, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A PHOTOGRAPHER'S BILL.—ROMANCE AND REALITY OF THE POLAR REGIONS.—PHOTOGRAPHY IN NATURAL COLOURS ONCE MORE.

A Photographer's Bill.—The Common Council of London objected the other day to pay a bill for some photographs. They discussed the document for half-an-hour, it seems, and then referred it back to committee. And the reason was this. It was a bill for photographing a silver casket, value £100, which had been made for presentation to some high personage, and the price charged for photographing the same was said to be £60. The photographer's fee does seem high, certainly, and Common Councilmen, no doubt, have some limit in money matters, except, perhaps, when they relate to a city dinner. So the Council decided they would not pay the bill until they could learn something more about it. We have no doubt a very good explanation will be forthcoming, and our only surprise is that it should be allowed to go forward to the public that any photographer should have made a charge of £60 for simply depicting a silver casket in the camera. The story is too absurd upon the face of it, and in all probability the charge is made for some resplendent printing in the way of mounts, in which city magnates are well known to indulge.

Romance and Reality of the Polar Regions.—Most people seem to have been disappointed over the Arctic photographs. "I do not think much of your Polar pictures at the Exhibition," visitors would often say, in discussing the attractions of the collection. What it was they wanted we do not know, but, for our own part, we cannot well see how the pictures could have been better. They were taken upon eight-inch plates, and this is a wonderful size, having consideration for the difficulties which must have beset the photographers on every hand. If there was not much to depict, that was hardly the fault of the photographer. You sent them into a region of frigid desolation, and they bring you back a faithful reproduction of the dreary scenes in the midst of which they lived for a couple of years. No doubt we most of us possessed a very different idea of the Polar regions, more picturesque and romantic than anything the photographs show us, and the reason for disappointment is more to be found in the fact that the place does not come up to our expectations, than in anything else. The photographs have disabused our minds of the idea that a Polar expedition can have anything romantic about it, and make us feel much more the hardships and sufferings which the crews were compelled to undergo. Photograph after photograph, as you turn them over, tells the same tale: wastes of snow, bleakness, loneliness, cold, and desolation. Could one have possibly imagined the endless inhospitable shores that fall upon the eye, the terrible sense of desertion and homelessness with which the dreary white wilderness must have inspired the crews during their weary sojourn? Look at the picture that represents the highest latitude photographed—"Lat. 82° 35', camp in Westward-Ho' Valley," appears on the picture. What does it show us? A hollow ice cavern, with walls of translucent blue, or a sturdy set of seamen comfortably grouped together, and wrapped up snug and warm in their coats and skins? Nothing of the kind. It is but a poor photograph, it is true, spotted all over, but it tells enough to make stay-at-homes shudder at the scene. The ground is white, as usual, and as far as you can see—it is not very far—there is a dreary waste of snow and ice. Two sledges have come to a stand-still; the dogs are lying down as if tired, and the men have desisted from their work for a moment, looking very much as if they would like to turn back without penetrating any further the cold, monotonous scene of

desolation before them. The photograph, as we have said, is but a very poor one; but it is not the less eloquent because of its blotches and imperfections. The low-lying headlands, the bleak shores, the frozen bays, and the glaring white snow everywhere—these are what is represented in the series of photographs before us; and, because they are not what we expected, we are not satisfied. Where are the prismatic icebergs, the floating islands of crystal, the magnificent peaks, the dazzling pinnacles, the placid inland sea, the wonderful conflicts between shaggy white bears and adventurous sailors? Alas! where are they? These pictures only tell us of a monotonous life, of terrible hardships, of an every-day existence of the most cold and comfortless kind; but they give, probably, the truest impression that can be conveyed to stay-at-homes of the dangers, difficulties, and terrible *ennui* that explorers to the Polar regions must be expected to suffer.

Photography in Natural Colours Once More.—Photography in natural colours is again announced, and this time it is the well-known photographer, Herr Albert, of Munich, who is credited with having achieved the glorious result. Results have been publicly exhibited, we hear; and, among other journals, our contemporary, *Nature*, says it is impossible to over-rate the value of the discovery. After all this prelude, it is a little disappointing to find out that it is the Ducos du Hauron theory once more, and that it is no nearer being carried out than before. Three negatives are prepared in such a way as to reproduce as much as possible of the red, blue, and yellow rays of an object. The three negatives are next printed (Herr Albert does this by colotype printing) so as to yield three monochrome images in red, blue, and yellow; or, rather, a sheet of paper, as in ordinary chromo-lithography, is printed with all three colours one after another. The result, of course, varies with the shade and nature of the pigments employed by the printer, and it is in his hands to make the copy more or less like the original. But what all this has to do with photographing in natural colours it is hard to understand. You have photographed a lady's dress of blue, and, if the printer employs a blue pigment in printing, the result may be a colour very different to what was intended. As everybody knows, in talking of pigments, there are scores of reds, and scores of blue, and scores of yellows, while the solar spectrum only knows one; this one, if green, for instance, may incline towards yellow or towards blue, but its purity is always the same. M. Ducos du Hauron, many years ago, submitted some transparencies placed one above the other, to secure the effect of three monochromes; but the result, though curious and interesting, was little else. M. Leon Vidal, whose praises have been sung so frequently in this branch of photographic printing, does little else beyond printing off one tint after another upon the same sheet from lithographic stones. Herr Albert, as we have said, employs colotype printing for his colours. From all accounts, the results of Herr Albert appear to be very charming examples of colour printing; but he would be the last man, we take it, to pretend that he had accomplished photography in natural colours.

COLLODIO-CHLORIDE PAPER.*

It is a very good plan to allow the collodions to remain unmixed, the first to be applied as a substratum for the second. The action of the collodion is just the same.

The prints are produced in a printing-frame, in the same way as those on albumenised paper; care must be taken, however, for it is necessary to bear in mind that the collodio-chloride paper is stiffer, and more liable to break up. The print must be examined with caution; it must be slowly and gently raised, and not lifted like a bit of ordinary silver paper. As in printing upon albumenised paper, it is necessary to let the printing go rather deeper

* Continued from page 575.

than it is to appear upon the finished print. At times it happens that the pictures lack depth, and in this case the printing should be conducted with a pad impregnated with ammonia; in other words, you place in the printing-frame, between the back of the picture and the padding, a flat kind of *sack*, filled with bicarbonate of ammonia.

Before toning and fixing, it is well to trim the pictures, so as to be as economical as possible with the gold bath. For toning purposes, two solutions are prepared:—

- 1.—Sulpho-cyanide of ammonium 40 grammes
Hyposulphite of soda... 4
Distilled water ... 1½ litre.
- 2.—Chloride of gold ... 2 grammes
Distilled water ... 1½ litre.

When using the above, equal volumes of both these solutions are taken and mixed together. As they keep very well, both of them—the latter being, indeed, very stable—it is in one's power to make up a toning bath very speedily. An impoverished bath is put in order by the addition of a few drops of solution No. 2. As soon as the prints have attained the right tone, which must not be of too blue a tint, they are washed in ordinary water, and fixed in the undermentioned solution:—

- Hyposulphite of soda... 40 grammes
Distilled water ... 1 litre.

For fixing, a period of from eight to ten minutes is necessary. In washing, a good deal of care is necessary. As I have already said, the paper is liable to crack and break, and for this reason the print must not be allowed to dry in a rolled-up condition. It is the best plan to mount the pictures while still moist.

By passing through a powerful rolling-press, the pictures at once obtain their full beauty. When retouched, they are coated with a varnish made up as follows:—

- Benzole ... 500 grammes
India-rubber ... 7
Mastic ... 15
Canada balsam ... 4

The india-rubber is in the first place cut into small pieces, and dissolved in a portion of the benzole; in the rest of the liquid is dissolved the mastic, and then the Canada balsam is added, and the two solutions mixed together. This varnish is poured upon the retouched picture, and the appearance of the latter is thereby greatly enhanced.

PRE-GLACIAL PHOTOGRAPHY.*

PHOTOGRAPHY is the most perplexing and mysterious branch of science and art. Several attempts have been made to write its history, and the results of such efforts have been palmed off on the public as authentic by several distinguished *literati*; but no sooner do these gentlemen complete what they consider a successful effort than they find, to their pain and disappointment, as he who attempts to remove a gold dollar from the bottom of a tin basin of water connected with a galvanic battery, that they have made a terrible blunder, and must either drop that subject or make further effort. For example, an inventive genius in Maine invents a burnisher; a genius still more inventive, from the suggestions given by the other, invents another burnisher, and discovers that neither he nor the other inventor are indeed the original inventors, because some one else with more genius than they had invented a previous invention. They finally dispute the matter, which results in a jointure that seems to promise peace, and here history rests on that subject.

Alas! however, the still more ingenious arises, and not only invents another burnisher, but finds that before photography was born, some far-seeing mind invented and patented still another burnisher as far back as 1790. The conse-

quence is, all the historians are at sea, and the true builders are blind with envious rage.

We do not propose, however, to make any such little and the little attempt we shall now make is to write a matter of photographic history of the most authentic character, and we shall go so far back that no one can dispute us. What we have to record is the finding of pre-glacial photographs. No one need to dispute this. No historian has ever reached so far back, and we are sure that no one can reach any farther. We desire to say first, what we have already noticed in this magazine, in the book of Holy Writ speaks of "pictures of silver," being well versed in the original Hebrew or Greek, we not define exactly what the Bible means by "pictures of silver." As we long ago stated, we had no doubt in our mind they were some sort of photographs, but while we can go beyond them in our pre-glacial theory, the subjects are no more or less, though very much hieroglyphic to be found in the ancient tombs and pyramids, and various structures in Egypt. A number of views with the late Egyptian Commissioner to the Centennial Exhibition, who was likewise an amateur photographer, and returned to Egypt with one of the American Optical Company's best stereoscopic boxes and outfit in Philadelphia pattern, both confirmed us in our theory.

It seems to be considered lawful to poke fun at many some of our contemporaries, but by virtue of these photographic discoveries we trust we shall be entitled to respect. Of course these discoveries do not establish any higher intellect than any other photographic editor, we do wish to be spoken of hereafter in a tone of great deference. If any one will go to Egypt and study the shape and position of these relics of a race now gone, and likewise examine the attention paid to position and light and shade, and especially to the position of the figures, we will agree that we are correct in our surmise. But there are still stronger evidences than what we have given. The pictures are not only photographic pictures, but they are often more permanent, and of a similar nature to the well-treated and badly-treated chromotype or pigment pictures. That these are pigment pictures no one can dispute that they are in strong relief, no one can deny; that they have stood the hottest sun in all creation, for ages, with scarcely any sign of deterioration, no one is bold enough to dispute.

We have recently received from our amateur friend a number of silver prints of these pre-glacial photographs and will be glad to exhibit them at our office during proper hours. We lament that there is no photographic museum in which they may be deposited, but we look at this theory as one of the most important that has ever been advanced since the birth of photography, to be chromotype not excepted. Various experiments have been tried to fix these photographs, by covering up a portion of them, exposing the rest to concentrated sunlight, but without visible change in colour; there was, therefore, no room for invention in the direction of trying to find some substance by which the pre-glacial pictures may be restored to their original colour. The colour is fixed.

Now we have determined the probable antiquity of the photographs may be a matter of interest to our readers, were guided by several indications: the first, the character of the relics themselves; and the second, by the fact that age of the pyramids and their neighbouring structures not been positively fixed, and therefore we indulge in a guess (a Yankee common right), that they are pre-glacial there is no exception to the rule that they are made of pigment; it is a matter of discussion still as to whether there is any gelatine mixed with the pigment or not. There are theories on the subject, and we do not propose to touch either. We are satisfied with the one great discovery we have already stated as having made.

We have no doubt, if the truth were known, that the ventions of Mr. Woodbury of his photo-relief process, is

* The Photographic Times.

Mr. Poitevin and Mr. Edwards, and many others, were misled by these pre-glacial photographs. How they made we do not pretend to surmise. That they exist, one can deny. The records to be found in the museums of Europe, so far as we have yet learned, do not give any indication or any formula. We know that the ancient Egyptians were given to artistic culture and practice, and it is reasonable to suppose that the formula for making these photographs is buried and lost with the one for building pyramids of the ancient style. It is very evident that they are but a few years younger, so to speak, than the pyramids themselves. We have no doubt these views will be supported by Professor Towler, and others, who have given the subject study.

Some persons have suggested in a very insinuating way that these admirable pictures are fossils. Were this so, they would have crumbled to partnership with the desert sand which lies at the feet of the great structures named, many centuries ago. Their style distinguishes them from anything that has been known or seen.

Our readers may be surprised that the fact that they are pre-glacial photographs has so long lain hidden, but this only shows that the failure to find photographs of a similar style and character in their case is no longer good evidence of the lack of the authenticity of these. Another wonderful argument in favour of our theory is, that the subject has been studied sufficiently to enable some one to come to a definite theory. We are sorry a race who was capable of making permanent and serviceable pictures did not leave us the formula in full detail. It may give photographic historians, however, some comfort to know that it is not probable that they can go further back than this, and as they may go on and complete their histories. It may encourage photographic invention a little, and make photographers a little suspicious about claiming originality for anything, lest they discover themselves mistaken after spending a great deal of money; but that we cannot avoid to commend our theory to them, and ask for it the usual amount of respect.

THE STATE OF BUSINESS.

PERHAPS there are few questions which interest the professional photographer more at any time than that involved in the "state of business." Every discovery, every improvement, every advance in the art, is interesting, so far as it relates to this all-important question. The state of trade has been for some time past, not in this country alone, but all over the world, more or less depressed; and as portraiture, and everything pertaining to art, partake of the character of luxury, photographic business has been among the first to feel the pressure. It is very difficult to suggest modes of meeting the difficulty; but a consideration of the experiences of others is often interesting and beneficial under such circumstances. Our Philadelphia contemporary has recently been making an inquiry amongst his correspondents and readers as to their recent experiences in connection with the state of trade, and has elicited various interesting communications relating to portraiture in the United States, some extracts from which cannot fail to be interesting, and possibly suggestive, to English readers. To facilitate the collection of information, our contemporary asked seven questions touching cardinal points of the subject, as follows:—

First. As to the prospects for business during the coming autumn and winter.

Second. As to what styles are found most acceptable to the public.

Third. What are the present prices asked for cabinet and card pictures?

Fourth. Is any improvement found in the tastes of the public, and does it appear to appreciate good work more than heretofore?

Fifth. Experience as to charging a good price, and making the best of work for your patrons.

Sixth. What sort of light do you use, and are plain or fancy backgrounds most acceptable?

Seventh. Do you find any increased demand for composition pictures?

The first answer given is sent from Boston, a high class, old established American city, regarded as the most English of American towns. Mr. E. L. Allen, an old established and successful portraitist, writes as to the state of business at the "Hub of the universe":—

In an experience of twenty-seven years the dullest should learn something. Just that length of time have I been engaged in reaping a living from the photographic business. I commenced at the bottom, and have done hard work of all kinds. As I came along up I have been outstripped in the race many times by those who knew more about making money than I did, but never by one who tried harder to do the best he knew how. Many years of my life in the business have been devoted to doing the best I could for every one who came along, without regard to a money return for my efforts. Now I can say my efforts are chiefly directed to getting the money, but at the same time without any abatement of my endeavours to make pictures all that can be made, with all the light and experience I have, combined with all that has been done by the many that have contributed to make our profession what it is. You ask for some details of our manner of doing business, &c. I will here say, mainly for the benefit of the younger members of the craft, who may chance to read these lines, that I have always made it a point to deal square; never to tell wrong stories, and always so far as in my power to give people an equivalent for their money. This word of advice I consider the more necessary, as you all know we have one of the most elegant chances in the world to swindle people if so disposed. A photographer's patrons are largely at his mercy. For instance, a customer may come in and inquire as to the durability of the specimens he finds on your walls. I have known the reply to be instant and all assuring. "O, those are permanent; they are finished in crayon!" when the facts were, the prints were solars, and the most perishable of anything that can be made in our line, and all the finishing in creation would not prevent them from fading. That I know to be practised up to the present time, and it is a blot upon our fair fame.

Any close student of the photographic art, or any one with only a bread-and-butter interest in the business, cannot but be more than pleased with the progress that has been made in the last few years. Indeed, it is truly astonishing. Go where one may, even to the most remote corners of the country, and we will find good and sometimes most excellent work made, and to my knowledge better pictures are being made to-day by some country than by some city photographers; and this more particularly in the comparatively new branch of carbon work. And now that I have to speak of carbon, I almost tremble with the feeling that I am treading on dangerous ground, for have I not read some of the articles that have been published on that subject? But I cannot tell you much about our business without speaking of it, so for that reason I must be excused. We are using the carbon process to-day successfully. We make nothing larger than cabinet card in silver. We do not consider it of so much importance for small pictures, because people sit often for those; but for everything designed to hang on the wall, all copies that require to be finished, everything from 4-4 to life size, are printed in carbon and finished by the best artists that we can command. We use the single transfer for our enlargements, which is very simple, and when it becomes known will be of very great advantage to the operator. At present it does not seem to be generally understood. It is known to many of your readers that my worthy partner, Mr. Rowell, started carbon printing in America more than a dozen years ago, and it has taken from that time to this to make it anything like a success financially.

Our prices are the highest that we can charge for the present quality of our work. When we can make better work we can charge higher prices. Prices have steadily advanced since the great war rush. We now charge \$6, per dozen for cards that we made then for \$5 and at the latter price we made money; now we can make no money on cards. Then we knew nothing about finishing negatives, or burnishing; now those operations consume a great deal of time. Then one sitting as a general thing sufficed; now it is the exception when a sitter orders

than it is to appear upon the finished print. At times it happens that the pictures lack depth, and in this case the printing should be conducted with a pad impregnated with ammonia; in other words, you place in the printing-frame, between the back of the picture and the padding, a flat kind of *sachet*, filled with bicarbonate of ammonia.

Before toning and fixing, it is well to trim the pictures, so as to be as economical as possible with the gold bath. For toning purposes, two solutions are prepared:—

- 1.—Sulpho-cyanide of ammonium 40 grammes
 Hyposulphite of soda... .. 4 "
 Distilled water 1½ litre.
- 2.—Chloride of gold 2 grammes
 Distilled water 1½ litre.

When using the above, equal volumes of both these solutions are taken and mixed together. As they keep very well, both of them—the latter being, indeed, very stable—it is in one's power to make up a toning bath very speedily. An impoverished bath is put in order by the addition of a few drops of solution No. 2. As soon as the prints have attained the right tone, which must not be of too blue a tint, they are washed in ordinary water, and fixed in the undermentioned solution:—

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By passing through a powerful rolling-press, the pictures at once obtain their full beauty. When retouched, they are coated with a varnish made up as follows:—

- Benzole 500 grammes
 India-rubber 7 "
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quence is, all the historians are at sea, and the burnishers are blind with envious rage.

We do not propose, however, to make any such blunder, and the little attempt we shall now make is to narrate matter of photographic history of the most authentic character, and we shall go so far back that no one can antedate us. What we have to record is the finding of some pre-glacial photographs. No one need to discuss this subject. No historian has ever reached so far back, and we are quite sure that no one can reach any farther. We desire to record, first, what we have already noticed in this magazine, that the book of Holy Writ speaks of "pictures of silver." Not being well versed in the original Hebrew or Greek, we cannot define exactly what the Bible means by "pictures of silver." As we long ago stated, we had no doubt in our mind they were some sort of photographs, but we believe we can go beyond them in our pre-glacial theory, and the subjects are no more or less, though very much, the hieroglyphics to be found in the ancient tombs and pyramids, and various structures in Egypt. A number of interviews with the late Egyptian Commissioner to the recent Centennial Exhibition, who was likewise an amateur photographer, and returned to Egypt with one of the American Optical Company's best stereoscopic boxes and outfit of the Philadelphia pattern, hath confirmed us in our theory.

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We have recently received from our amateur friend a number of silver prints of these pre-glacial photographs, and will be glad to exhibit them at our office during all proper hours. We lament that there is no photographic museum in which they may be deposited, but we look upon this theory as one of the most important that has ever been advanced since the birth of photography, the chromotype not excepted. Various experiments have been tried to fade these photographs, by covering up a portion of them and exposing the rest to concentrated sunlight, but without any visible change in colour; there was, therefore, no room for invention in the direction of trying to find some substance by which the pre-glacial pictures may be restored to their original colour. The colour is fixed.

How we have determined the probable antiquity of these photographs may be a matter of interest to our readers. We were guided by several indications: the first, the character of the relics themselves; and the second, by the fact that the age of the pyramids and their neighbouring structures has not been positively fixed, and therefore we indulge in our guess (a Yankee common right), that they are pre-glacial; there is no exception to the rule that they are made of pigment; it is a matter of discussion still as to whether there is any gelatine mixed with the pigment or not. There are two theories on the subject, and we do not propose to touch either. We are satisfied with the one great discovery we have already stated as having made.

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Seventh. Do you find any increased demand for composition pictures?

The first answer given is sent from Boston, a high class, old established American city, regarded as the most English of American towns. Mr. E. L. Allen, an old established and successful portraitist, writes as to the state of business at the "Hub of the universe":—

In an experience of twenty-seven years the dullest should learn something. Just that length of time have I been engaged in reaping a living from the photographic business. I commenced at the bottom, and have done hard work of all kinds. As I came along up I have been outstripped in the race many times by those who knew more about making money than I did, but never by one who tried harder to do the best he knew how. Many years of my life in the business have been devoted to doing the best I could for every one who came along, without regard to a money return for my efforts. Now I can say my efforts are chiefly directed to getting the money, but at the same time without any abatement of my endeavours to make pictures all that can be made, with all the light and experience I have, combined with all that has been done by the many that have contributed to make our profession what it is. You ask for some details of our manner of doing business, &c. I will here say, mainly for the benefit of the younger members of the craft, who may chance to read these lines, that I have always made it a point to deal square; never to tell wrong stories, and always so far as in my power to give people an equivalent for their money. This word of advice I consider the more necessary, as you all know we have one of the most elegant chances in the world to swindle people if so disposed. A photographer's patrons are largely at his mercy. For instance, a customer may come in and inquire as to the durability of the specimens he finds on your walls. I have known the reply to be instant and all assuring: "O, those are permanent; they are finished in crayon!" when the facts were, the prints were solars, and the most perishable of anything that can be made in our line, and all the finishing in creation would not prevent them from fading. That I know to be practised up to the present time, and it is a blot upon our fair fame.

Any close student of the photographic art, or any one with only a bread-and-butter interest in the business, cannot but be more than pleased with the progress that has been made in the last few years. Indeed, it is truly astonishing. Go where one may, even to the most remote corners of the country, and we will find good and sometimes most excellent work made, and to my knowledge better pictures are being made to-day by some country than by some city photographers; and this more particularly in the comparatively new branch of carbon work. And now that I have to speak of carbon, I almost tremble with the feeling that I am treading on dangerous ground, for have I not read some of the articles that have been published on that subject? But I cannot tell you much about our business without speaking of it, so for that reason I must be excused. We are using the carbon process to-day successfully. We make nothing larger than cabinet card in silver. We do not consider it of so much importance for small pictures, because people sit often for those; but for everything designed to hang on the wall, all copies that require to be finished, everything from 4-4 to life size, are printed in carbon and finished by the best artists that we can command. We use the single transfer for our enlargements, which is very simple, and when it becomes known will be of very great advantage to the operator. At present it does not seem to be generally understood. It is known to many of your readers that my worthy partner, Mr. Rowell, started carbon printing in America more than a dozen years ago, and it has taken from that time to this to make it anything like a success financially.

Our prices are the highest that we can charge for the present quality of our work. When we can make better work we can charge higher prices. Prices have steadily advanced since the great war rush. We now charge \$6, per dozen for cards that we made then for \$6 and at the latter price we made money; now we can make no money on cards. Then we knew nothing about finishing negatives, or burnishing; now those operations consume a great deal of time. Then one sitting as a general thing sufficed; now it is the exception when a sitter orders

from the first set of negatives. The rule is to sit twice, and often three times, not because we have not made good pictures; they acknowledge they like them, but want to try again, just to see if they cannot get something better. Even babies are brought to sit over, on account of expression, so fastidious have our customers become. We use three glasses on a sitter, as a rule, making two impressions on a glass for cards, and the same size glass for cabinets, making one impression. We have no trouble in getting our prices; our only trouble is how to increase the cost of our work—that is, make it worth more money. We consider our success to depend entirely upon maintaining high prices, and never losing sight of the main point, viz., to make the best work we know how.

As to how much the public taste has improved it is hard to say, but that it has improved there is no doubt. When a sitter comes with two or three sets of proofs, and tells you he wants to sit again, but don't know why, and finally orders from the first set, you begin to doubt any cultivated taste, or even common sense on the subject; and yet it happens every day. On the other hand, and to offset that, we must look at the other side, and I would not be doing justice to a large number, and by far the better part of our patrons, did I omit in this article to bear testimony to the many flattering compliments bestowed upon us by the most cultivated and appreciative people of this city.

Our great point now is permanency. For nearly thirty years we have been making pictures that have lasted indifferently well, some longer, some shorter, but a large majority of which are faded and gone. In the face of these facts we cannot expect the public to be very enthusiastic, or even take our word at par for anything new we may have to offer them, considering the amount of lies that have been told them. Consequently we must expect to pay away for some time to come to eradicate the present impressions on the public mind, and substitute something better.

Business thus far this year has been good, considering the extreme general depression, and we look for increased improvement in the autumn.

For styles we confine ourselves strictly to plain portraiture, and attempt little in the fancy line. This, I think, is indeed more by the taste of our customers than of our own choice. Accessories are very well when rightly used, but in unskilful hands are better omitted. We cannot all be Saracys or Notmans, neither are the tastes alike in different communities, therefore we must be governed largely by circumstances and the demands of those who seek our services. Herein lies the secret of success in our business (and in every other, for that matter), to combine all the advantages that a quick eye and active brain can discover, with the greatest possible amount of amiability of which human nature is capable.

My experience is that this long-suffering public, whom we have so fearfully abused, would have no hesitation in getting even with us by walking off with any amount of goods if we would let them; therefore we demand payment of all small sums at the counter, unless it is somebody that we very well know; and it is because we do know some very well that we make this little demand. Of course we have names on our books that we would be only too glad to charge any amount. We make our bills monthly, and have little trouble in collecting. It is a part of our religion—indeed, the first article of our creed—to pay our bills, and we consider it a charity both to ourselves and our customers to make them do likewise. A man owing a bill in one place is very apt to go elsewhere for an article in that line if he happens to be a little short, so we think that pay as you go is the best practice for all concerned.

"The next portraitist who gives his experience is Mr. G. M. Carlisle, of Providence. He says:—

As to what style of picture I find most acceptable to the public, my answer can be made in one single word, to wit, vignettes. My price for card vignettes is \$6 per dozen, and \$3 per half dozen.* My price for a card photograph, plain or in any other style but vignette, is \$4 per dozen, and \$2.50 per half dozen. Of course we show samples of the different styles of printing, and the vignette is chosen by my patrons in nine cases out of twelve, which is very satisfactory to me; for I not only get the extra dollar per dozen, but I am enabled to give my patrons the style of picture I myself prefer. In my judgment there can be nothing made so neat as a clean white vignette mounted on a simple white mount, without guilt or

other ornament. I admit that I like the bevel-edge card, but the difference in price between the plain white card and the bevel-edge is about \$25 per 1,000, and the public do not appreciate that difference. I am strongly in favor of the materials, and have no doubt that many valuable prints have been spoiled by being mounted on a card that contains deleterious matter, and dampness affecting the same soon destroyed the print.

Just here I would mention a little experience I had two years ago, which led me to decide to use only the best mounts I could get. I had an order to furnish some photographs for advertising purposes in the street cars, and the advertiser obtained cards from his printer, with such matter printed upon them as he desired, leaving a blank space in the centre for the photograph which I made with the usual care, and in less than ninety days every print had turned more or less yellow, which I can attribute to no other cause than impure card stock.

To return to the subject of vignettes, I think the same preference exists for larger pictures to be printed in the vignette form, even to life-size; for although my price for vignette cabinets is \$9 per dozen, while the plain are but \$6, a majority prefer the vignette.

Your next question is the most important for the proprietor of every gallery in the country to ask himself, to wit, "Do you find any improvement in the taste of the public, and do the people appear to appreciate good work more than they formerly did?" I should answer most emphatically, Yes. The whole public from the most ignorant to the best judges, seem to want the best they can get, and those who are at all able will pay for a good thing, and would feel ashamed to give, in return for a picture they had received from a friend, a picture that would all appear to be of less value than the one they had received.

Mr. Editor, if one of your friends should present to you, in exchange for the best card you were able to procure, a tintype or a miserable card made by one of the dollar-a-dozen men that friend would not elevate himself very much in your favor and the public pretty generally understand this matter, and when their means will permit they will patronize an establishment where good work is done, and where a good price is asked and obtained.

Your next question as to what kind of light I use can also be answered in one word, to wit, weak. I do not use more than half the light that I did ten years ago. My present light is what is known as top and side combined; is of white ground glass; northwest exposure, and twelve by twenty-two feet, the top light being twelve by fifteen, and the side light twelve by seven; the pitch of top light being about forty-five degrees and the lower part reaches to about nine feet from the floor where it rests on the side light, which extends to within two feet of the floor, but curtains cover nearly the whole light, and only a subdued light reaches the sitter; but, Mr. Editor, there is much humbug about this light business. If the operating-room is of good size you can find a favorable spot beneath most any kind of light for the sitter, and excellent results are often produced beneath what would be termed a bad light. Very much more, in my opinion, depends upon good management of light and shade than the particular angle, the point of compass that your light enters, or whether the glass be ground or plain. Yet I should want to avoid a glass the colour of which would give any color to the light in the room. If brick or other objectionable buildings surround your operating-room, I should by all means, use white ground-glass, and, as I said at the Buffalo Convention, "filter your light more and your bath less;" for if a light be objectionable in colour after it has passed through a white ground-glass, it has been filtered of its objectionable rays, and will be found white, and works quick; in a word, I can get along with but little light if it is pure white.

You ask if I am in favour of fancy backgrounds. I would say that I do not wish to be without several, yet I have always been more successful with a plain ground, and believe a woollen, with a shade of grey adapted to your light, the very best made. Composition pictures would, no doubt, be more admired and sought after if there were not so many shown that were at once ridiculous. Every person of sense who has examined a dozen composition pictures made with fancy backgrounds could discover something in eleven of them that, as the street gamins say, would "give them plumb away," or, in other words, could discover some blunder made in the composition that made the picture a botch, if not an impossibility, and for this reason I confine myself pretty much to what I am most likely to make a success. The land is large enough and firm

* About equivalent to \$1 and 12c.

enough for me to walk upon, so I keep out of balloons. I am making a picture which I find very pleasing, and call them "Paragon Portraits." The negative is made on plate 18 by 22, and when finished, cut out about 17 by 21, and mount on board 22 by 28. I seek to imitate the old-style steel engraving of about that size; the figure or figures are not larger than is usually made on 10 by 12, or say figures not more than from 8 to 11 inches; this enables you to display furniture, &c., to good advantage without crowding at all. I charge \$10 for making a negative, and \$5 for each finished print, which, although a very low price, I had much rather do than cards at \$5 per dozen.

You ask my views as to price; they are these: I believe any man, whether of more or less experience, will be better off to charge a good price for his work, and a man will bring to his gallery just such a class of trade as he caters for; if his price is well up he shows the public at once that he places some value on his work, whereas if his price is below the average he leads the public to think that he does not himself consider his work up to the standard, for if he did he would ask as much as others. Of course, this reasoning is subject to location to some extent.

Next to my gallery, and within fifty feet of my door, a man has been making sittings for ten cents all winter, but, like the hoary frosts, he is no more. Do you believe for a moment that the better class of trade entered his doors? Not at all; but had that ten cent advertisement not been at his door, people of good taste and plenty of funds might have gone in, for you know good pictures can be bought to put in showcases at doors, and many may be deceived thereby—once, and only once."

(To be continued.)

DRY COLLODION.

MOST DESIRABLE PRELIMINARY COATINGS TO BE USED IN THE DRY PROCESS.

BY ERNEST BOVIN.*

A GREAT number of preliminary coatings have been recommended, but in reality there are but two kinds practically useful. These are solutions of caoutchouc in benzine, and albumen highly diluted with water. It is difficult to decide which is to be preferred; both have their good qualities and defects. My opinion is, that when using alkaline development caoutchouc is indispensable, whilst for acid development albumen is much to be preferred.

The great advantage offered by the previous coating is, that the operator is not obliged to use so much care in cleaning the plates. The coating preserves the latent image from injurious substances incorporated in the glass, and protects them from superficial impurities. It also serves to retain the collodion, and prevent blisters and raisings.

I would also remark that the development of the latent image is much more easily done when the glass is "albumenized" than when it is covered with rubber. Those who are interested in this question can easily convince themselves by covering one-half of a plate with a coating of albumen, and the other half with rubber varnish; in the development of each of these halves they will observe marked differences.

I give the preliminary coatings which I use, and which always have given me satisfactory results:

ALBUMEN FOR PRELIMINARY COATINGS.

Albumen of an egg	... 30 c.c. (8 fl. drs.).
Water	... 20 c.c. (5 fl. oz.).
Acetic acid	... 1 c.c. (17 minims).

Add slowly the acetic water to the albumen, stirring with a glass rod, then add 200 c.c. (6 fl. oz.) of water, again agitate, and let it stand for several hours; decant the clear part, filter first through a sponge or fine cloth, and then through paper until perfectly limpid. This acetic albumen may be kept for a long time, and the cleaned plates are coated with it in the ordinary manner, using, if necessary, a glass rod, and carefully avoiding the formation of air-bubbles; after complete desiccation they are kept in a grooved box until required for use. It is best to use weak solutions, as those that are concentrated produce syrupy streaks, which are to be avoided.

* *Photographic Times from Moniteur.*

RUBBER VARNISH FOR PRELIMINARY COATINGS.

The best and simplest manner of preparing the rubber varnish is as follows:

Rubber	... 0.2 to 3 decigr. (3 to 4 grains).
Pure benzine	100 c.c. (3 fl. ozs.).

The mixture is kept in a warm place for several days, and is then filtered through paper. It is sometimes necessary, in order to hasten the solution of rubber, to wet it with chloroform or ether, and wait several hours before adding the benzine. It is necessary to use ground or masticated rubber, as that in sheets and tubes is not soluble. Rectified benzine, free from fatty matter, should be used. The coating on the glass should be dried before a quick fire; the higher the temperature the less chance there is of seeing this coating crack. If the proportion of rubber dissolved in the benzine is too great this last accident is sure to happen. It is also very advantageous to add a few centigrammes of gum guaiacum. If the solution is not clear it is clarified with a little of the dissolved chloride of calcium. This takes hold of the water which causes the turbidity of the solution, and, being insoluble in benzine, remains on the filter.

ARTISTIC LIGHTING AND THE GENRE CALLED REMBRANDT

BY M. SCOTTELLARI.

THOSE portraits are called Rembrandts which imitate the manner of the celebrated Dutch painter. It is the marvelous secret of effect of light possessed in such a high degree by the great master, and of which all his pictures bear the impression, which photography happened to penetrate, and which it applies in its productions. Portraits of this kind shine, indeed, by a luminous fineness in the colours. This it is which constitutes the relief, and especially in the lighted lines of the face, as well as by a transparent half tint and spread full and softly over the shadowed parts.

In this manner, whatever might be the sitting of the model, the effect obtained is always the same. If three-quarter, the model turned to light is brilliantly lighted in a sparkling manner from the back, and the other part is shadowed in a transparent style. In profile, the parts of the face jutting out turned towards the light are the only lighted ones; the others are slightly shadowed. Facing the extreme parts of the face, from the side where the light comes, are the only lighted, and nearly the whole face is in a penumbra transparent and soft, which gives relief and life to the portrait by the animated expression which produces the harmony between the lighted parts and the half tints.

Generally the model must be placed in the middle of the studio, that is, in the middle of that light which illuminates so that the small three-quarter is turned towards the sparkling light from the back, and the large three-quarter shadowed. The sparkling light from the back must predominate on the model; the curtains in front are to advance or to retire more or less, in order to give to this light a greater vigour.

The eyes of the model turned towards the light must be protected carefully against false reflections. This is easily obtained by observing that the luminous point of the eyes is small and well defined, and without deformity. This is, among others, the principal proof by which is recognised whether the model is lighted in its real proportions.

As much as possible it is desirable that the negative be enough exposed to obtain a perfect harmony of all the tints.

In the Rembrandt manner busts only, or ovals and vignettes, are usually made. Nevertheless, to obtain modelled portraits with all the half-tints, and to satisfy different tastes, it is sufficient to place the model in the middle of the studio. If the model receives a uniform light from the large three-quarter side and a sparkling light from the back, it gives a picture with transparent shadows, which constitute the real modelling of the portrait.

The curtains can be in certain cases suppressed; for instance, in taking children, provided that the model is in the middle of the studio, and, if wanted, the top light modified

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LANTERN READINGS.

THERE is no source of education and amusement to which photography has been of more signal service than the magic lantern. It has aided, elevated, extended, and given precision to the educational value of the lantern in an amazing degree. The most skillfully hand-drawn transparencies were incomparably inferior, in representations of natural objects for scientific illustrations, to the photograph, the enlarged image of which, projected on the screen by a good lantern, is, indeed, in many cases, like nature itself. But this very precision has its drawback. The close resemblance in the colourless monochrome, cold, frozen, and voiceless, seems to create a new want by its very beauty. Every object, every scene, is dead:

So coldly sweet, so deadly fair,
We start, for life is wanting there!

And the effect of a succession of such slides, perfect in detail and admirable in truthful rendering of form, is at times almost depressing, especially upon an audience of young people. There is, however, a very definite remedy for this drawback upon colourless photographic slides. A skilful lecturer can practically invest with life and clothe with colour the cold forms by interesting notes, comments, and suggestions. The petrified street scenes will begin to teem with life as descriptive and historical sketches are given; the tropical foliage, rendered by black-and-white in the slide, will glow with colour, and become musical, as well as bright, with the fluttering birds and butterflies, as the lecturer describes the lavish wealth of nature. Slides which illustrate a narrative become vividly dramatic, and the events rapidly pass before the eyes of the audience. But, unfortunately, in many communities in villages, schools, families, the skilful lecturer, or "showman," is wanting; and Mr. York admirably supplies the hiatus in the extensive and excellent series of Lantern Readings he has issued. We have already from time to time had occasion to notice some as they were issued. We have now before us a series of a dozen more, comprising a singularly comprehensive range of subjects, each written by an author specially familiar with the subject. The ablest lecturer will find his trouble materially reduced, and its results probably enhanced in value, by using these Readings; but their chief value will be found in the family and school room, or in village communities, where any one who can read with care may give the highest value to a lantern display which might otherwise have become somewhat wearisome. Take, for instance, a set of views illustrating the Highlands of Scotland, for which Mr. York has issued a very fine series of slides, Glasgow, its cathedral, and other noteworthy architectural views

come on the screen, and scenes on the Clyde follow, on to Oban through the Kyles of Bute. After visit; Staffa and Iona, the imaginary tourist is led on to Glenora. So far, we have passed through scenes full of scenic beauty, full of historic and associative beauty. But without the aid of such Readings, three-fourths of the interest would be lacking. The pictures are charming, especially a good view of the wondrous basaltic rock forming Fingert Cave; but they can tell no story, although every detail of the history and association teems with romance. The grand sublimity of the Pass of Glencoe is striking on the screen; but the well-told narrative of that cruel massacre a chivalric Scotland, surpassing Bulgarian horrors in ruthlessness, gives a strangely thrilling interest to the scene. So, again, with a visit to India. The grand, massive, and elaborate architecture of Indian temples becomes a little tiresome after examining (say) fifty of them without description or comment; but the descriptive and historical sketches, interspersed with anecdotes in the Mysore Reading, give altogether a fresh interest and value to the series. We have here, besides those mentioned, readings for the Lowlands of Scotland, the Falls of Niagara, the Tower of London, and Westminster Abbey, a Year Within the Arctic Circle, Central Africa, the Holy Land, and Prince of Wales' Visit to India. Then, to vary the essentially instructive series, we have Comical Talk, to accompany four series of amusing slides. A very capital and interesting series of slides illustrate the "Pilgrim's Progress," and the Reading summarizes admirably the story of the wonderful dreamer. Finally, we have a didactic Reading entitled "Boons and Blessings." The slides consist of various scenes in life, and the Readings give stories, apologues, and comments, written in a bright and interesting style, calculated to interest as well as to instruct, or, in fact, calculated really to instruct because they first interest.

We have noticed these Readings somewhat at length because we wish to interest our readers in them for two especial reasons: in the first place, the season of the year necessarily and happily brings together gatherings of families and friends, brings round anniversaries of school meetings, &c., and nothing can more easily and surely enhance the pleasure of such gatherings than a good lantern display accompanied by such Readings; and in the next place we regard these Readings as materially aiding in removing stigma which we have not infrequently heard cast on photographic slides, namely, that they were cold and uninteresting, however undeniably beautiful, and that a series of hand-painted slides generally interest an audience more, although it might be granted that it instructs them less.

Mr. York has for years practically held chief command of the market for photographic slides, the extent, excellence, and comprehensiveness of his stock being absolutely pre-eminent. With these Readings he provides endless amusement as well as boundless instruction, which we can heartily commend to all our readers.

TWO NOVEL PHOTO-MECHANICAL PROCESSES.

At the *Photographischer Verein*, which seems to have taken a new lease of life, and the transactions of which are promised us regularly in the *Wochenblatt*, we learn that recently two novel printing methods were brought forward by the Secretary, Herr Düby. The latter seems to have exhibited examples of the processes, so that we may presume they represent successful work.

The first, which was termed a negative printing-plate, is thus described. A thick plate of patent plate glass is albumenized, collodionized, and sensitized in the ordinary manner. After exposure, intensifying, and fixing, the plate is warmed by pouring upon it hot water; then a gelatine coating is applied to which has previously been added a few drops of a saturated solution of bichromate of ammonia. The plate is now exposed to light from the

back, the superfluous chromate washed out, when the film, after it has been rolled up with an ink roller, is ready to print from in a press.

The other process, of which Herr Duby also furnished examples, was as follows: A print in pigments or carbon was taken from a negative, and the impression transferred to a copper-plate. In contact with the latter, the image was developed, and subsequently from the pigment picture an electro-plate was taken. We suppose the latter would answer merely in the case of line sketches or engravings.

THE CRITICAL EYE.

BY W. HEIGWAY.

I DON'T want to make you miserable or dispirited at the outset by the repetition of that well-worn and encouraging maxim so oft-repeated of art writers—that the artist, like the poet, is born, not made—because I for one more than half doubt its truth.

Like a good many other sayings, smart and happy-sounding enough, it is not strictly correct in its general application.

Still, there are some unhappily put-together beings (and not a few in the photographic ranks) who would not make even tolerable blacksmiths. When we regard their clumsy, unsympathetic natures, the perplexing question arises in one's mind, What on earth are they fitted for? And the answer is not easy to find. Certainly, such men are not likely to do much for the advancement of the aesthetics of photography.

Without a natural perception of pictorial effect, a recognition and admiration of the beautiful, and a knowledge of what that beauty consists in, not the greatest amount of industry will ever make an artist.

On the other hand, the greatest natural capacity, the most magnificent genius even, cannot get along without a knowledge of the rules and a study of the principles on which pictorial effect is based.

The artist is an interpreter of Nature; but one will make a beautiful and interesting rendering, whilst another will give a vilely hard and "literal" translation.

Ten to one, the uglier picture (especially if it be of a pretty woman, and the critics are dear friends) will be gushed over as being *so truthful! so artistic!* and gain more attention and admiration than the happier and more amiable one, which will, of course, be branded by the critic's curse as being a flattering likeness.

What awful nonsense that is about the *truth* of an ugly picture!

If Heaven puts it into the mind of the homeliest individual on this earth to look sweet and bright for once, why should we resent it as a personal injury, and order that face back to its habitual ugliness?

I don't care how *unusual* a pleasant expression may be to a face, how ill-favoured and ugly it may be in general, I am sure a smile will never spoil its character, or rob it of likeness.

To the critics no lie is so outrageous as a good-natured *smile*.

Learn to look at your subject broadly, as an entirety, take a liberal interest in it, and think the very best of it; your nature is capable of, striving rather to do your duty to Nature than to pander to the malevolence of critics.

If you regard a face in this broad, honest fashion you will find that Nature has generally not done her work unhandsonely; that, however "faulty in detail" it may be, the "general effect is not bad."

Where is the object in trying to see more than you are intended to see? When you have before you a face Heaven tells you to admire, why will you strive so hard to discover the tiny blemish (?) you need never see—the pimple behind an ear, or the little mole under the chin? Are you happier when you have made the discovery?

Do not peer into a complexion to discover how blotched

and freckled it is, as if you were a jealous rival. The colour on the cheeks of that girl gives her a healthy and interesting appearance, and you cannot but be pleased with the effect. Why, then, should you take a magnifying glass and find out how coarse the finest skin is, and how blotchy is Nature's colouring?

If there is an ugly turn to the nose, an unprepossessing twist to the mouth, or an inequality in the shape of the eyes, only note these defects (if they are defects, which I don't by any means admit!), only note them, to avoid giving to them undue prominence in your picture.

When I tell you to educate the perceptive faculty which is of so much service to the artist, it is with the caution against using it to the prejudice of the beautiful. Better be blind as a worm, than to have eyes only to faults. Educate yourself to appreciate Nature's perfect work, and your own work will nearer approach the standard of perfection than if you are always finding fault with Nature.

I know you think honesty demands of you an *exaggeration* of plainness, and it is extremely satisfactory to your amiable instincts when you have succeeded. You experience a glow of honest pleasure when you have thus succeeded in your "duty."

Hang such "duty" and such "truth;" try to represent the reality, and the result will be ever so much handsomer than your jealous eye would have thought possible. Try, just for once, to *exaggerate the beauty, if you can!* and see how you feel after it!

If you have the true feeling, your experience will be that you can never hope to do full justice to your model, and your priggish self-satisfaction will give way to a more humble and wholesome admiration of more perfect work than you can ever hope to do. I think—nay, I know—you will account yourself a gainer by your loss.

RETOUCHING.

BY NORMAN MAY.

So much has been written on retouching, by able hands, that I am somewhat reluctant to touch on a subject which would seem to have been worn almost threadbare; but the remarks of "Focus, Juno." lead me to think I may possibly be of some service to him, and perhaps others of the photographic fraternity. He says he placed the transparent collodion film in contact with the negative. He will find, I think, that if he puts the iodized film two inches from the negative instead of in contact, a great difference and improvement will result.

In proportion to the coarseness of granularity of ground glass, and the distance the negative is from it, so will the coarseness, heaviness, and irregularity of the retouching be. The nearer the ground glass, the coarser the touching, and *vice versa*.

It will be found that by putting the ground glass two or three inches from the negative, it will be out of the focus of the eyes when they are directed to the negative, the granulation will almost or quite disappear, and in proportion will the light be softened, and lose a great deal of its concentrateness, though little of its brilliancy. If the ground glass or similar substance is placed close to the negative, the granularity will not only be more apparent, but, when reflected by a mirror, the light will be found much stronger in one spot than in the rest of the surface, requiring the negative to be moved to it or the mirror adjusted, so as to bring that bright spot just where it is wanted.

Now if the ground glass is moved towards the mirror two or three inches, the light will be softer and more diffused in proportion to the distance moved. Care must be taken that no light gets to the inner surface of the ground glass, as its object is not to reflect, but to transmit and diffuse light.

One of the best—perhaps the best—substitute for ground glass, is to coat a good piece of clean stout plain glass with a hard spirit varnish, dry with heat as in varnishing

a negative, and when perfectly cold and hard, rub the surface gently and evenly with the finger, using, if necessary, a little powdered resin to start the roughening action, and going all over it till a regular, dull surface is obtained. Care must be taken that the varnish is well-filtered, and thoroughly free from grit, as each little lump will have a kind of shining halo round it which will much interfere with the retouching if it happen to come on a vital part of the negative. This is about as fine a substitute as it is possible to have, easily prepared, inexpensive, with care not easily damaged, and, if necessary, quickly and easily replaced.

Spirit varnish applied to a cold plate, and dried without heat, will also give a matt surface, but it will not be nearly as tough, or bear the handling the former will, even though it be heated when thoroughly dry, which greatly hardens it.

Ground glass varnishes, the solvents being generally benzole or ether, applied cold, are often coarse in texture, and almost always easily scratched. Another excellent substitute, costing almost nothing, and one to be found in the general shop of every village, is a sheet of common white tissue paper, which, if slightly oiled, will be found more transparent, and possess an almost homogeneous texture. Better still is a sheet of *papier mineral*, kept by every stock dealer, and used by nearly all photographers for a variety of purposes. If either of these substances is placed, say, two inches from the negative, which may rest on a sheet of plain glass, it will be found that thereby the light is diffused and softened, but not, as a whole, lessened, and the retouching can be done more perfectly and with infinitely more comfort than when there is nothing between the mirror and the negative but a sheet of plain glass.

Some people with weak eyes may, and do, find it necessary to use a strong light, but the retoucher in full use of his eyesight will not only find the glare unnecessary, but decidedly uncomfortable, and injurious not only to the retouching, but himself. Very late in the day, or with an exceptionally bad light in the winter, it may be found useful to work without the ground glass, but at such times it would be wiser, if possible, to leave a negative of any importance till the next day.

Making amends in a measure for the under-exposure or shortcomings of the negative, by putting detail in the hair and eyes, is a task which requires a man who is not only an artist in feeling (as every photographer should be), but in touch—one who has a good practical knowledge of drawing, and a smattering of anatomy. The majority of retouchers not possessing those requirements and accomplishments, it would be better for them, as a rule, to leave the hair, alone, as the public, I know, prefer an unobtrusive dark place, even if it looks slightly patchy, to seeing the hair, which some of them take so much pride in, come out like a mass of ginger beer bottle wire, severely straight, stringy, stiff, and unnatural. If a man has really the skill, no doubt a great improvement can be made in those thick black masses of shadow; but how many retouchers have it? Out of a hundred photographs that have had the hair "doctored," ninety-nine of them will be the reverse of improved. Much better in such a case than putting a lot of parallel lines on the face of the negative, is to coat the back of it with matt varnish, or stretch a piece of mineral paper on it, and put some broad lights slightly on that, not white patches, but semi-transparent touches, which can either be done with paint, pencil, or a stump.

(To be continued.)

PHOTOGRAPHIC NOTES OF A JOURNEY ON THE CONTINENT.

BY AN OCCASIONAL CORRESPONDENT.

IN conformity with my promise, I forward you part of some notes and observations which I intend to collect in various parts of the Continent through which I shall pass,

wherever I think this may possess interest from a photographic point of view.

I crossed successfully the part of the German Ocean between Queensborough and Flushing, in Holland, and after a few hours' further journey by railway I arrived in Brussels. Belgium is a country which presents great interest to many persons connected with photography in England. An amateur looking for a subject for his camera will find a large field, great variety, very easy and inexpensive access, with perfect freedom from official hindrances, unfortunately still the order of the day in other countries. The finest sites for landscapes are the environs of Liège, Dinan, and Aix Spa, where wild scenery comparable to the Alps, with, of course, glaciers and snow, side by side with arcadian views, or most picturesque river sides with fantastically broken horizon lines, are discovered on every hand. It is superfluous to mention that for persons having more inclination for architectural or archæological photography the Belgian cities, such as Gand, Antwerp, Bruges, Brussels are unrivalled. The buildings of Brussels can certainly be considered as representatives of the architectural skill of our age. It will be interesting to note that forty or sixty of the finest houses adorning principally the new Boulevard Central were planned by the ablest architects of the world, in consequence of the very substantial premium offered for general competition.

My first visit was to the Musée Royal—an institution unique in its character, and deserving more than passing note in a photographic journal. The Musée Royal is the National Gallery, British Museum, and Kensington Museum joined together, of course in portion to the size of Belgium. Industrial schools attached to the Institution offer all facilities, free of charge, and also free of any formality, to those who are willing to study chemical, physical, and mechanical sciences. But photography, thanks to the extraordinary perseverance and unexampled energy of our friend M. Rommelaere, acquired in Belgium not only right of citizenship, but also place of honour. It is principally to the exertion of that gentleman is due the fact that photography is recognized as a science, whose progress and propagation are seconded, and that very effectively, by the Government. The means adopted for this propagation are the establishment of a photographic department in connection with a chemical laboratory, and every year a course of lectures on photography is delivered by M. Rommelaere, who is also chief of the chemical laboratory, which is opened free to everybody, independently of profession or nationality. The enthusiastic beginner, or even practical photographer in difficulty, always can find a remedy in the skill and friendly help of Mr. Rommelaere, and can verify on the spot the applicability of the theory to the practice.

Many of your readers have heard of the existence of the Belgian Photographic Society. This new Society is also founded through the instrumentality of M. Rommelaere. It is under royal patronage, and extends its action to all the Belgian territory, being formed of Gand, Bruxelles, and Liège, sections holding meetings in these respective towns. The number of members, which is very large, is formed of both amateurs and professionals; the meetings are numerously attended, and are enlivened with discussions of the details of processes—so earnestly, indeed, that, not unfrequently, morning dawn surprised (still discussing) some members of this new but energetic Society.

The photographic laboratory contains a very fine collection of apparatus of all kinds. Nothing is wanted here for the study of every branch of photography, from small, medium, and large size cameras, of English, American, and French make, to the very powerful hydraulic press, enabling the inquirer to try Woodburytype on twelve by ten plates; the heliostat of Von Monckhoven, and also much smaller, made in Dublin, similar to one we had the opportunity to witness when used by Captain Abney in his spectroscopic researches. As far as I could ascertain, English cameras

are especially appreciated for out-of-door work, while American are very highly spoken of for studio work. For heliotype there is here a lithographic press; but this department is not yet developed.

Among the apparatus that attracted especially our attention, in consequence of its unusual form, and certainly valuable in the establishment we describe, is a very elaborate camera on its stand, with electrically-moved clock, connected with instantaneous shutter and alarm. By means of this apparatus exposure of the plates can be regulated automatically, either instantaneous or longer, with precision. This apparatus, though useless to a practical man, cannot be too highly appreciated by a scientific photographer. I secured the negative of this apparatus.

It would be out of place to describe here the purely chemical part of the laboratory; but I cannot pass, however, unnoticed, two apparatuses, without which no photographic laboratory can be considered complete. One of these is the electric regulator of temperature, of which I here enclose a hand sketch.* The sheet-iron chamber, with doors, is fixed to the wall, and is heated from the bottom by means of the gas Bunsen burner; through the upper part of this chamber is introduced the thermometer and another tube filled with mercury, but opened in the upper part. By means of the platinum wire soldered in the lower part of this tube, and another loose platinum wire introduced to the desired depth in the same tube, electrical connection can be secured when the mercury reaches a certain height. These are appendages; but the principal apparatus is a metallic box with a glass front. The gas, before it reaches the burner, must feed this box, and then exude from the box by another tube. The box, however, is not empty, but contains an electro-magnet and an iron bar, which, when the electric current is set up, is attracted by the magnet; and, when in this position, obstruct also the passage of the gas from the box to the burner. It is clear that once the maximum temperature is decided, and the loose platinum wire accordingly placed, the temperature in the hot chamber will be regulated automatically. There are many photographic operations requiring this regulation of temperature. How, for instance, can heliotype be worked without it? And dry plates? I also have made electrical regulators of different construction; but I was so struck by the simplicity of this one, that I became proprietor of it, and this at the comparatively moderate price of forty-eight francs (exclusive of chamber).

Another (to me) new, but very valuable apparatus, is a balance for ascertaining the specific gravity of the liquids, giving marvellous precision, going up to five numbers. It is small, neat, manipulation is very easy, and very superior to the glass hydrometers, in which, when liquids of great density are used, the numbers are confounded.

Notwithstanding this bright aspect of the matter in the Belgian photographic world, M. Rommelaere, wishing every member to work as hard and be as successful as himself, is grumbling; but let our readers judge for themselves what is the energy of, at least, some of the members. During my visit to the museum just described, I found there a special commission appointed to decide the claim of M. Warnerke, from London, for the prize offered by the Society for a competition for the emulsion process. The commission was composed of five members: Captain Hannot and Captain Delaunoy, from the War Department; Count de Pitiers and M. de Faavjell, very distinguished amateurs; and M. de Blockhouse, president of the commission, and proprietor of a large heliotype establishment in Brussels. Warnerke's demonstration, comprising preparation of the emulsion from the beginning till its definite condition (worked) does not occupy more than two hours, and this demonstration was crowned with perfect success. The commission, in order to have a clear conscience before the Society, insisted on preparing

all his chemicals also, such as pyroxyline, and bromine of zinc, and only after five days very hard work in the laboratory decided to depart (with copious notes supplied by M. Warnerke) to their distant residences. When such an energy is displayed by a commission having no personal interest in the matter, who can grumble at the inactivity of the individual members?

I had also the pleasure during my stay here to make the acquaintance of the newly elected President of the Society, M. de Montefiore. He is a very respected amateur, and being by his education a mining engineer, and by his choice the most devoted cultivator of the science, the Society finds in his person not only the energy distinguishing all other members, but also a most competent judge in the matter of science.

(To be continued.)

PHOTOGRAPHS IN NATURAL COLOURS.

BY DR. H. VOGEL.*

IN my last communication I spoke of the remarkable so-called prismatic photographs in natural colours which Albert, of Munich, exhibited in the Nurnberg Exhibition, which have been the subject of a great deal of discussion. As I hear, the matter has already been ventilated in the general newspapers, and the statement has gone forth that photography in natural colours is already an accomplished fact. Nay, more. The public have already begun to ask for photographs in natural colours at the Berlin studios. I do not know personally what has been written on the subject, for it appeared in my absence; but as the pictures have at any rate been a good deal talked about, it will interest everybody to know something more about the prints in question. Herr Albert, during my sojourn in Munich, permitted me to see everything in the most friendly manner, plates, originals and proofs, and communicated to me sufficient of the process to permit me to form a judgment upon it.

The Albert pictures are in no way photographs of coloured pictures taken direct from nature, but are simply prints in colours. If three pigments are used—red, blue, and yellow—upon the same ground, all sorts of tints may be secured. If red is withheld, then green is the result; if all three pigments are printed off upon one and the same spot, then a sort of black is produced; if red and blue alone are used, violet is the result. Every picture may be regarded, therefore, as the result of mixing up red, blue, and yellow, colours which are used in different quantities throughout. If one will imagine for an instant a coloured carpet with a ground of aniline-red, yellow border, and green flowers, you have in the aniline red a mixture of red and blue, in the yellow, as a rule, a mixture of yellow, some red, and a little green, and in the green a mixture of yellow and blue.

A skilful printer in colours reproduces a pattern of this kind by preparing several stones. Upon one he merely sketches the green flowers, on another only the aniline ground, and on the third only the yellow border. All three stones are then printed off upon the same paper, and yield a chromo-lithograph. It is exactly in this way that Obernetter does his work; only instead of stones he employs for his work Lichtdruck plates, and instead of sketching he prints off portions of a negative in certain tints.

Albert proceeds in this manner—he prints with three different Lichtdruck plates the three colours, red, yellow, and blue, one upon the other. He produces his three-colour plates in a very original manner. The process comes originally from that of M. Ducos du Hauron, who, three years ago, essayed to prepare coloured pictures by taking three negatives, secured respectively through red, green, and violet glass. In the negative taken through red glass the red light was supposed to be strongest; but,

* By some accident the sketch has been omitted by our correspondent.—Ed.

* Photographische Notizen.

unfortunately, as we know, red light is very inactinic. By making use of my discovery, however, Ducos was enabled, by the aid of tinted collodion, to secure three suitable negatives.

Albert proceeds in a similar manner. He produces three negatives, the first with a collodion which is sensitive for all tints with the exception of red; this subsequently produces a Lichtdruck plate for red. A second negative is secured with a collodion which is sensitive to all colours excepting yellow; and the result is a Lichtdruck plate for yellow. Finally, a third negative is secured, on which all colours excepting blue act; and from this a Lichtdruck plate for blue is secured.

Photographers will probably remark, in regard to the last, that such is an impossibility—that there is no plate or collodion which is insensitive to blue. To a certain extent they are right, but Albert helps himself in this way. He takes his picture through coloured glass—a yellow glass put before the lens, for instance—cuts off the blue rays, and allows all others to go through, and it is then merely a question of making the collodion sensitive for all other colours—red, yellow, and green. This is done, as I have shown, by the addition of certain well-chosen substances. Thus, aldehyde green renders collodion sensitive to red rays, aniline red makes it sensitive to yellow, and eosine to green. Of course, the manipulation of these pigments in collodion is by no means easy; they ruin the dipping-bath, and the plates require long exposures, while other defects crop up. That the problem may be practically solved, however, Albert has shown us; he has produced negatives of coloured patterns in which the blue is the most transparent, and upon which, moreover, no traces of the retouching brush or pencil are to be seen.

Next comes the question as to the nature of the pigments to be employed in printing. There are, for instance, a hundred sorts of blue by means of which blue prints can be obtained, and the same may be said of blue and yellow. Which shall be taken? That which approaches most nearly to the original, is naturally the answer. And so it happens. The printer chooses the colour to the best of his ability, and thus produces the nearest approach to the original; but he is not employing natural colours. The natural colour of the original has, it is true, contributed to the production of the negatives; but it has nothing to do with the printing from the Lichtdruck plates. This is an operation entirely independent from the rest, and if the copies are like the original this is due to the skill of the printer in matching the colours; the finished tint is more or less like nature, but nature has had nothing to do with their application. So much must be said on the score of truth, although I do not wish to detract one jot from Albert's very difficult and interesting *modus operandi*.

Correspondence.

THE LATE EXHIBITION: INJURY TO PICTURES.

DEAR SIR,—We see by the letter of "An Exhibitor" in the correspondence column of your issue dated November 30, that we are not the only exhibitors at the late exhibition whose pictures have been returned to them piecemeal. Ours were completely destroyed; glasses smashed, corners of frames broken off and scratched, the pictures all scratched, too, by the loose fragments of glass, thus rendering them useless, even when the frames were repaired and regilded. Everything was loose in the case, and must have been knocking about during the entire journey. They had been carelessly placed in, and the lid nailed on (not screwed, as it was when it left our hands); and, moreover, when we packed the pictures (three 15x12's) each one was separately screwed to battens, which battens were screwed respectively to the bottom and lid of the case, and one in the centre screwed to

blocks made fast to the side of the case, which is the only way to pack gold frames safely, and the one generally adopted by all frame makers; but when packed to return, they had just been laid in the case, one on top of the other, with small pieces of newspaper under the corners, and two small sprigs knocked into the ends of the case to keep them down, the frames in length just fitting the inside of the case; but as for the battens and screws, they were nowhere—perhaps, being "either wasted or appropriated to other uses," as "An Exhibitor" suggests.

Now, these annual displays of the progress made in our beautiful art certainly lead to much good, and act as strong incentives to all to try and infuse more of the artistic element into their work, as the quantity of such increases every exhibition; but such treatment of pictures as we complain of will, we think, seriously militate against the success of future exhibitions, as it will certainly deter those so treated (and others as well who, doubtless, intend exhibiting) from sending their work. We are not those sort of persons who may justly be classed as "inveterate grumblers," and are prepared to make some allowance for injury to frames, &c., considering the large quantity to be packed and returned to their respective owners at the close of the exhibition; but we do think that pictures and goods (be they ever so humble) are entitled to a small modicum of care and consideration from the packers—whoever they may be—which our work certainly had not.—We are, yours truly, **BARRY & CO.**

Hull, December 1st.

M. SCOTELLARI AND REMBRANDT EFFECTS.

SIR,—Is not M. Scotellari claiming too much? In his method for applying light for supplementary exposures, he ignores all that has been done by others, and now in your last issue he claims the "special manner of lighting called genre Rembrandt," which he says he came to England to introduce in 1871. I do not find M. Scotellari's name in the index of the PHOTOGRAPHIC NEWS for that year, neither have I any recollection of his teaching; but I do remember shadow portraits and Rembrandt effects long before that year. In my chapters on "Pictorial Effect," first published in the PHOTOGRAPHIC NEWS in 1868, I gave a wood-cut illustration of a similar effect, and a description of the way to produce it; and in the volume of the reprinted chapters published in 1869 I gave a photographic illustration of this kind of picture. The first pictures lighted in this manner I ever saw were done by Rejlander many years before this kind of lighting was reduced to a commercial system (if I may so call it); first in Germany, afterwards in America, where very beautiful examples were produced in 1869 by Mr. Kurtz and Mr. W. J. Baker. It was in America that these pictures obtained the very inappropriate name of "Rembrandt Effects."

Perhaps M. Scotellari will tell us what he claims. He neither invented nor introduced Rembrandt effects into England, and there is nothing in the method he describes of producing them, as far as I can understand from his rather confused description, that has not been known to the readers of the NEWS since 1868.—H. P. ROBINSON.

[There appears to have existed for some time past a confusion in the minds of many photographers who regard "Rembrandts" as a novelty of late years. They are confounding a name with a thing. A few years ago the "Rembrandt" style was claimed as an American novelty. The name has only been introduced of late years, and the style of lighting, as commonly applied to general portraiture, belongs to recent years; but two of the earliest and finest pictorial photographs we remember were distinguished by having figures lighted in what is called the Rembrandt fashion; we refer to Mr. Rejlander's "Two Ways of Life," and Mr. Robinson's "Fading Away." The preservation of a breadth of shadow, and the use of a few precious lights, has been a distinguishing quality in Mr. Robinson's pictorial work.—ED.]

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of this Association was held on Thursday evening, the 29th ult., at the Free Library, William Brown Street—the Rev. H. J. PALMER, President, in the chair.

The SECRETARY reported what had been done at the meeting of the associated literary, scientific, and art societies of Liverpool in regard to the intended soirée to be held in St. George's Hall, on the 14th December. Twenty-three societies were associating together, so that there was no doubt the soirée would be a great success. In order that photography should be well represented it was desirable that those having anything of interest connected with photography which they were willing to exhibit should at once notify the same to the Secretary.

The minutes of the previous meeting were read and passed.

The SECRETARY then read the following—

Annual Report.

“In presenting the fourteenth annual report we have again to congratulate the Association on its continued prosperity. Eight new members have joined, and only three resigned. Our meetings have been, on the whole, well attended; and, though only a few papers have been read, a variety of objects connected with photography have been brought forward by members, which have been sufficient to sustain the interest of our meetings. The presentation print has been chosen from a negative taken by one of our own members, and we are again indebted to the kindness of Mr. O. R. Green, who has placed at the disposal of the Council one of his enlarged negatives of ‘The Arch of Constantine.’ This will be printed from in carbon during the ensuing spring. The President, in his opening address, gave an account of his experiments in search of a substitute for glass for dry plates, and a paper was also read by Mr. J. H. T. Ellerbeck on the same subject. Papers on ‘Comparative Experiments with Various Dry Plates,’ by the President; ‘On the Use of the Actinometer with Dry Plates,’ by Mr. J. H. T. Ellerbeck; and ‘Another Method of Working the Gelatine Process,’ by Mr. H. Houlgrave, have been read, and a practical demonstration of Mr. Leach’s enlarging process was given by the President. A number of tissue negatives, kindly lent by Mr. L. Warnerke, were exhibited, and a communication from him with reference to their development was also read. This year it was decided to hold meetings in July and August, and, on the invitation of the President and Mr. Ellerbeck, these meetings were held at their respective houses. The weather on both occasions proved unsuitable for outdoor work; but, notwithstanding, the meetings were greatly enjoyed. A Saturday afternoon excursion to Bidston took place in July last, and, although short notice was given, and the day was dull and unfavourable, about a dozen members attended, and some satisfactory negatives were secured. Our album has received some contributions, and there is still room for more. Owing, no doubt, to the absence of a lantern at our meetings, there has been no donation to the collection of lantern slides. The Treasurer’s report will no doubt be considered highly satisfactory, there being a good balance in hand.”

The TREASURER then read his report, which showed a satisfactory balance in favour of the Association, after paying all expenses.

The PRESIDENT said that no doubt the members would be pleased at receiving such favourable reports from the Council and Treasurer; and he thought that, having a good balance in hand, there should no longer be any hesitation in purchasing a lantern, so that at any time the members could exhibit slides without having to make special arrangements for doing so.

It was agreed that a suitable lantern should be purchased.

The undermentioned officers were then elected for the year 1878:—

President: H. A. Wharmby.

Vice-Presidents: Thomas Clarke, and J. H. T. Ellerbeck.

Treasurer: A. Tyrer.

Hon. Secretary: Wm. Murray.

Council: Wm. Atkins, J. A. Forrest, W. King, Rev. H. J. Palmer, W. M. Pendlebury, E. Phipps, Rev. J. D. Riley, W. B. Roberts, L. W. Weber, Ed. Whalley, W. H. Wilson, and E. Twigg.

A vote of thanks was passed to the Library and Museum Committee of the Corporation for the use of the room in the Free Library.

Several actinometers were exhibited, but the most convenient

and portable for dry plates appeared to be one made in the shape of a box about the size, but a little thicker, than a penny. The lid was of glass painted a suitable tint, with a slit of clear glass, the box containing discs of sensitised paper. As soon as a tint had been obtained, by slightly turning the lid a fresh segment of paper was exposed under the clear glass, and so on until the disc was covered, when it could be replaced with another.

Mr. W. H. KIRKBY exhibited a hot-water tin for drying washed emulsion plates. By drying at 150° or 200°, he avoided a multitude of spots, which he was sure to get if he allowed his plates to dry spontaneously. Mr. Kirkby also exhibited a photomicrograph of a diatom taken on a dry plate, with an exposure of thirty minutes by artificial light.

Mr. W. KING showed an interesting view taken on the deck of the steam-ship *Germanic* in mid-Atlantic. Mr. King said the exposure was twenty-two seconds, and though the steamer was going at a good speed, no signs of motion were observable, the print being perfectly sharp.

Albums and views of the season’s work were exhibited by Mr. Kirkby and others, Mr. Roper showing a number of photo-mechanical prints.

The meeting was shortly afterwards adjourned until the last Thursday in December.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.*

THIS Society held its third annual soirée on Wednesday evening at the Belle Vue Hotel, Bradford. Tea was provided by Mr. Clark in his usual first-class style.

After tea (of which about seventy partook) the evening was spent in a social manner, songs, duets, and recitations being given by the members and friends—among whom were Mr. and Mrs. Hartley—in good style, the proceedings being conducted by the president, Mr. E. Greaves, of Halifax.

A large number of photographs—many of a very large size—were exhibited by the leading photographers of the United Kingdom. Amongst the chief contributions were Messrs. Boucher (Brighton), V. Blanchard (London), Slingaby (Lincoln), Faulkner (London), and Brightman (Bristol). Amongst the local exhibitors were Messrs. Sachs, Appleton, Passingham, A. Megson, T. Burrows, and H. Rogerson, of Bradford; Mr. E. Greaves, of Halifax; and Messrs. Wormald and Broadhead, of Leeds.

An interesting lantern exhibition of Continental views, &c., was given during the evening by Messrs. Howarth, Burrows, and Rogerson, which was highly appreciated by the company.

Mr. Davis, of Bradford, fitted up a telephone from the meeting-room to a distant part of the premises, and, through its medium, songs were sung and dialogues carried on with the utmost ease and distinctness.

A large quantity of apparatus interesting to professional men was likewise shown. The specimens of artistic work brought together in this exhibition are very interesting, and illustrate in a marked degree the great advance which has been made in photography during the last few years. Portraits are, of course, the chief feature, and of these there are a large number, Mr. Albert Sachs, Messrs. Appleton and Co., Mr. Passingham, and other well-known local names being admirably represented. It is satisfactory to observe that in the matter of pose a very marked improvement has been made, for, let the sun do its work ever so well, unless the photographer is artist enough to know how to manage his figures, the result is unfavourable. The specimens of instantaneous portraits of children are capital, and there are a number of exquisitely clear landscape photographs. Altogether, the exhibition is an exceedingly good one, and may be taken as representing the photographer’s art at its best. Where there is so much that is really artistic and good and painstaking, we will not attempt to draw invidious comparisons, but recommend our readers to pay the exhibition a visit: It remains open only to-day.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of the Society will be held on Tuesday next, the 11th inst., at the Water Colour Gallery, 5, Pall Mall East, at 8 p.m., when the subject for discussion will be “The Emulsion Process.”

* Bradford Observer, December 1st.

A PHOTOGRAPHIC ACTION.—This was an action brought by the Woodbury Permanent Photographic Printing Company, of Great Portland Street, to recover from the defendants the sum of £20 for work and labour done; the defendants being Messrs. De la Rue and Co., publishers, of Percy Street, Edgware Road. The plaintiffs' manager, Mr. Fry, said that the defendants brought to their establishment twenty-eight negatives to be printed from by the Woodbury process for the Academy Album. The order was given early in May; and the proofs, which required considerable time in execution, were forwarded from time to time by the plaintiffs, and sent by instalments to the defendant, with the request that a cheque should be sent on account; but as this was never received, the present action was brought. The plaintiffs' traveller, called, proved that a cheque had been promised, and if a cheque had been received, one hundred copies (in accordance with the Company's scale) would be sent; but as this was not done, the Company pressed for the money due, as the printing of extra copies would entail but trifling expense; this being the plaintiffs' case. The defendant urged that fourteen proofs sent out of the twenty-eight were so imperfect as to be unfit for publication, and he had complained of this to the plaintiffs. The plaintiffs, being recalled, denied this. The defendant said he told the plaintiffs that if one hundred copies would be sent, a cheque for £20 would be forwarded. At this stage of the case it was arranged that a judgment for £20 should be entered for the plaintiffs, with costs on the higher scale; but the plaintiffs said that if £10 with costs on £20 were paid within a week, no further proceedings would be taken. The case then terminated.

ON CHLORIDE OF IODINE, BROMIDE OF IODINE, CHLORIDE OF BROMINE, AND THEIR BEHAVIOUR WITH WATER.—W. Borne-mann says:—"Iodine takes up the more chlorine the more water is present. Bromide of iodine is soluble in water without any important decomposition. Chloride of bromine dissolves in water with a yellow colour; the solution retains the odour of chloride of bromine, bleaches litmus, and quickly loses the greatest part of the chloride of bromine on exposure to the air. The author confirms the statement of Schützenberger that pure chloride of iodine in a sealed tube remains liquid in the cold, but congeals on opening. In presence of ICl_3 it crystallises, even in a sealed tube. On the distillation of ICl_3 it is partially resolved into iodine and ICl , the same decomposition being also produced on prolonged exposure to the air. Bromide of iodine is a crystalline body of the colour of iodine; it is partially decomposed on distillation, and sublimes in frond-like aggregations of crystals. There does not exist a hydrated bromide of iodine of the formula $Brl + 5H_2O$, nor an analogous hydrated chloride of bromine."—*Chemical News*.

COMMUNICATIONS FROM THE LABORATORY OF THE UNIVERSITY OF HALLE.—These consist of a paper on "Diacetonamin and Vinyl-diacetonamin (Isotriacetonamin)," and a memoir on the "Action of Hydrocyanic Acid upon Hydrochlorate of Diacetonamin," both by W. Heintz.—*Chemical News*.

To Correspondents.

ALIQUA.—There are various modes of toning transparencies. The use of a neutral solution of chloride of gold, about four grains to the ounce, after the transparency is fixed and washed, gives a fine intense black. Perhaps the best method for transparencies, where the aim is to get blackness without piling up, or in the slightest degree interfering with delicacy, is to immerse the fixed and washed plate in a five-grain solution of bichloride of mercury until it has acquired a uniform grey tint, then wash and immerse in a weak solution of sulphide of ammonia for a few minutes. This gives a warm, intense black, and the image appears crisp and delicate. We believe those you name are produced in the copying camera, but we cannot just now with certainty say.

PERPLEXITY.—Many causes will produce a reduction of the gold to a bath into the metallic state, and it is difficult to indicate what without a precise knowledge of the history of the individual bath. A common cause is using unclean fingers in the solution. A very slight contamination with some other chemical would make the fingers set up a reducing action in the gold bath. Even in the absence of such a cause, if a solution of neutral chloride of gold be allowed to stand in the light, it will often cause decomposition and reduction. Absolutely neutral chloride of gold is not necessary for the acetate bath.

A CONSTANT SUBSCRIBER TO THE NEWS.—Whenever a gas stove or gas fire of any kind is used in the dark room, a flue or chimney of some kind should be provided to carry off the products of combustion, or they may be injurious to sensitive plates.

TROUBLE.—Your negative arrived, as it could not fail to do when so inaccurately packed, in some scores of fragments. Paper or cardboard will not protect glass. The fragments do not enable us to judge of the nature of your trouble, but we can form some idea from your letter. The most common cause of cracking in the unvarnished film is keeping the negatives in a damp place. It may be the quality of the varnish, but it is more likely the damp. Keeping the varnish in tin would not affect the matter. As a remedy, take very finely powdered charcoal or soot, or black-lead. This will fill up the cracks, and make them scarcely visible in the print. The vapour of alcohol will also repair the damage by rejoining the cracked edges.

SIR THOMAS PARKYNS.—The colouring (madder of madder) has been found very difficult to use in carbon printing, from the fact that bichromate of potash precipitates it, and hence, when the tissue containing it is sensitized, the gelatine film generally is stained or coloured by it. So far as we can see, your prints being tinted throughout, this would not to you be a disadvantage. We will make your request to Mr. Johnson. We are waiting with anxiety to see your specification. You ought to receive the *News* on Saturday morning. When do you receive it? We hope to receive a communication from you for our *YEAR-BOOK*.

J. WATKINS.—The chalk which remains at the bottom of the solution should be removed. You may either filter or pour off the clear solution. The precipitated chalk at the bottom would be useless and troublesome. There is no need to throw away any of the solution which has not been used; merely carefully pour it off and leave the residue behind. Be careful to use a perfectly clean vessel for the solution, and never touch it but with perfectly clean fingers, as a slight thing causes the solution to decompose and become useless. Be careful and persevering, and better times will come.

R. GORDON.—Neutral chloride of gold in solution in water is very apt to be reduced if it stands in sunlight, or even ordinary daylight. A solution in alcohol, absolute or highly rectified alcohol is best, is much less liable to this decomposition.

A large number of communications relating to the *YEAR-BOOK* received with thanks. Several Correspondents in our next.

METEOROLOGICAL REPORT FOR NOVEMBER

BY WILLIAM HENRY WATSON, F.R.S., F.M.S.
Observations taken at Braystones, near Whitehaven,
26 feet above sea-level.

Date.	BAROMETRIC PRESSURE.			TEMPERATURE IN DEGREES.			REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.	
1 29 97 30 00 30 00	46°	50°	48°	Fair, but gloomy			
2 29 8 29 70 29 48	46	48	48	Rain this evening			
3 29 60 29 45 29 85	44	43	41	Showers a.m. and p.m.			
4 29 54 29 40 29 28	45	47	48	Rain this evening			
5 29 24 29 38 29 30	47	50	48	Rain a.m. and p.m.			
6 29 20 29 24 29 10	48	51	48	Rain a.m. and p.m.			
7 29 14 29 17 29 15	48	44	44	Fair, but gloomy			
8 29 45 29 45 29 30	48	40	46	Rain this morning and evening			
9 29 15 29 11 28 98	48	50	43	Rain a.m. and p.m.			
10 28 82 28 60 28 34	49	50	50	Rain a.m. and p.m. Strong wind			
11 26 40 28 23 28 28	50	53	50	Very heavy rain, with very strong wind all day			
12 28 50 28 60 28 74	48	43	43	Rain and hail, with strong wind a.m. and p.m.			
13 29 17 29 60 44	—	44	44	Fair, generally sunny			
14 29 77 29 75 29 71	41	47	43	Heavy rain, with strong wind this evening			
15 29 72 29 87 29 83	40	58	58	Fair, but gloomy Wind at night			
16 29 47 30 02 30 11	49	53	50	Showers p.m.			
17 30 11 29 90 47	—	50	47	Fair, generally bright			
18 29 73 29 75 29 76	44	49	47	Rain a.m.			
19 29 50 29 41 29 30	46	48	48	Heavy rain a.m. and p.m.			
20 29 34 29 24 29 34	45	47	42	Fair, generally bright			
21 29 31 29 24 28 84	42	47	51	Rain a.m. and p.m.			
22 28 79 28 76 28 76 49 5	49 8	46	46	Rain & hail showers a.m. & p.m., with strong wind. Sheet lightning at night.			
23 29 27 29 38 29 42	45	42	44	Showers a.m. and p.m. Meteor. S.W.			
24 29 28 29 22 29 30 39 5	43	34	34	Fair, generally sunny			
25 29 16 29 65 29 78	34	41 5	37 3	Fair, generally sunny			
26 29 62 29 34 29 05	46	48	46	Heavy rain and strong wind this evening			
27 29 28 28 91 45	—	43	43	Heavy rain this evening			
28 28 71 28 30 28 78	44	44 5	42	Heavy rain, with wind, at night			
29 28 73 28 68 28 68	44	45	44	Rain at night. Windy all day			
30 28 45 28 71 28 78	41	48	41	Rain all day. Very gloomy			

Summary.		Mornings. Noons. Nights.		
Highest temperature observed	...	50°	50°	50°
Lowest ditto	...	38	41 5	34
Mean ditto	...	43 3	45 0	43 4
Mean of all observations	...	48° 2		
Number of days on which rain fell	...	...	...	23
Number of fair days	...	...	...	3
Number of fair days bright	...	...	...	6
Number of fair days gloomy	...	...	...	8

NOTE.—The rainfall during the month was exceptionally high (higher than that of any month during the last seventeen years), 10 98 inches.

The Photographic News, December 14, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND—PHOTOGRAPHY IN FICTIONAL LITERATURE.

The Institute of Chemistry of Great Britain and Ireland.—The Institute of Chemistry of Great Britain and Ireland is the name of a new Association which has been for months in embryo, and now bursts forth in publicity. It is avowedly an offshoot from the Chemical Society; and seeing that its main object appears to be precisely similar—namely, to promote the cultivation of chemistry as a science—it is hard at first to understand its *raison d'être*. The actual reason for forming the Institute can, however, hardly be gathered from the prospectus or particulars put forward, as the same is more understood than expressed. Professional chemists—or, at any rate, those apparently to whom the formation of the Institute is due—have found that F.C.S., or the Fellowship of the Chemical Society, does not secure to them the position they desire. These gentlemen desire to be on a par with Civil Engineers, and it is their aim to establish an institution like that of the Civil Engineers in Great George Street. It is not clear what the advantages of the new Institute are, beyond that “of paying so much a year” to belong to it; and one cannot help feeling that, as the prestige of the Chemical Society at Burlington House will be considerably weakened by the advent of the Institute, the former will not look upon the latter with favour. It is true a very large number of the Fellows of the Chemical Society belong to the new Institute; but that is simply because they have been elected without their consent, and it is questionable as yet how many will take up their membership. Of course, any institution, so long as it helps on the progress of scientific investigations must be regarded as useful; but we suspect it is the progress of chemists rather than chemistry which is the principal object of the new body. Whether the Chemical Society or the Institute will in future lead the way is a matter which will be determined by the leading chemists supporting one or the other; but the circumstances that the Chemical Society is a chartered body, that it is recognized by Government in so far that a home for it is provided at Burlington House, that it can afford to publish monthly a journal of one hundred and twenty pages detailing the progress of chemistry throughout the world, and is in possession, moreover, of a large research fund, will be grave difficulties in the way of the Institute in pushing itself to the front. In the meantime we can well sympathise with young and capable chemists who desire to make way in the world, and heartily wish them success in their endeavours to appear to advantage before the public eye; but we cannot help thinking that if a large number of them would take degrees in science, they would hold a far higher position in the eyes of the world than they can possibly hope for by belonging to an institute of their own creation.

Photography in Fictional Literature.—Photographers have hitherto played but a small part in literature or works of fiction. We suppose that authors have not yet become sufficiently accustomed to the general prevalence of photographic portraits to base incidents and events upon such things. Thackeray and Dickens—who wrote most of their works twenty or twenty-five years ago—had not seen enough of *carte-de-visite* and other portraits, for these were still novelties at that time. But the time is not far distant when we shall have the photograph playing an important part in a plot, and old, forgotten photographs turning up to prove that the heroine is really heiress to the property in dispute, or that the hero is at present so like the picture of his *soi-disant* father, that further doubt is out of the question. It is true that the greatest *cause célèbre* in which photography played somewhat of an important rôle—we allude to the Tichborne case—was not assisted very much by the photo-

graphic evidence, for, although all pictures of the undoubted Sir Roger presented us with the outline of a very thin one, the Claimant in the flesh was (as everybody knows) a very fat one. Witnesses who swore they recognized in the Claimant the veritable Sir Roger seemed to base their remembrances upon the back of the individual; and, as no photograph of the unquestionable Sir Roger's back was forthcoming, there was no opportunity for any comparison. In the case of Dion Boucicault's drama of the *Ockeroon*, our readers may remember the main incident turns upon a photograph—or, rather, a photographic reaction; but in this case the matter is by no means satisfactory, since the incident is a perfectly impossible one from a photographic point of view. A man is sitting on some mail bags, and in this position is having his portrait taken on a wet collodion plate. The person entrusted with the exposure, if we remember rightly, is a negro, and he is instructed to uncup the lens, and to run off to the nearest tree and back again before capping once more. The negro does as he is told; he uncovers the lens and rushes off. In his absence the murderer makes his appearance behind the sitter, and with a blow from a big stick kills the latter and then rifles the mail-bags. Hardly has he done this, than the negro returns. The murderer flies, the nigger caps the lens, and then seeing the poor man before him dead or dying, at once takes summary vengeance upon the camera, which he imagines to be the cause of the mischief. But afterwards the plate (without in any way being developed or fixed) is taken out of the debris, and this, on examination, shows a clear picture of the murderer and his victim. Retribution of course follows, and justice is done before the curtain falls. It is just as well, perhaps, that photography does not find favour with the writer of fiction, if he makes such sad mistakes as these, for although the reader knows very well, when he is reading a story or play, that there is not a grain of truth in the whole from beginning to end, still there is nothing that takes away the interest he feels so much as an impossibility or a lack of knowledge of the subject of which he treats. We have said that neither Thackeray nor Dickens made any point of photography in their writings, but the latter had something of the sort in his mind when he makes Sam Weller talk of the profile machine in writing his valentines to the pretty housemaid. Sam says, our readers will remember, in that famous composition, “The first and only time I see you, your likeness was took on my hart in much quicker time and brighter colours than ever a likeness was took by the profeel macheen (wich praps you may have heard on, Mary, my dear) although it does finish a portrait and put the frame and glass on complete with a hook at the end to hang it up by and all in two minutes and a quarter.” Photographers nowadays would have to work hard to beat the “profeel macheen” at this rate, no doubt a rapid means of securing silhouettes being in the great humorist's mind when he penned the lines. Daguerreotype was not made known to the public until 1839, while Dickens, we are told, commenced writing the *Pickwick Papers* in 1837, and finished them probably in 1838; of actual photography, therefore, he could have known nothing when Sam Weller wrote his famous valentine.

FRENCH CORRESPONDENCE.

FRENCH PHOTOGRAPHIC SOCIETY—M. JANSSEN'S DISCOVERY—SECURING HALF-TONE UPON IMAGES OF THE SUN—THE GAYACINE PROCESS AND M. FLAMENT'S MODIFICATION—CAPTAIN WATERHOUSE'S EXPERIMENTS UPON GELATINE—BROMIDE EXPERIMENTS.

THE monthly meeting of the French Photographic Society was held on Friday last. The principal interest of the evening was concentrated in a communication from M. Janssen, which accompanied some solar pictures recently taken by that astronomer in his observatory at Meudon. I have, in my previous letters, already described this remarkable establishment, together with the apparatus employed

for securing photographs of the solar orb every day. This constant work of securing pictures of the sun every twenty-four hours is for the purpose of obtaining records which may have an appreciable value hereafter. For two years past the processes and apparatus employed have been the object of continual improvement, and, naturally enough, the results secured from day to day have been of a progressive nature. While at first the images of the disc measured but six centimetres in diameter, those which are produced at the present day in the Meudon studio attain to a size of thirty centimetres. The essential condition being to reduce the exposure to a minimum, M. Janssen has succeeded by the most ingenious disposition of mechanical arrangements, adapted to his shutter or cap apparatus, to contract the exposure to the fantastic figure of $\frac{1}{1000}$ of a second. This minute fraction of time suffices to secure for the image all its details; only, as a matter of course, much time and care are necessary in the development of the image. Sulphate of iron is the developer employed, but a series of intensifying operations follow. Little by little one can see the surface of the image become covered with granular markings which may be likened to grains of rice, willow leaves, &c. These markings, which the savan has hitherto only been able to dream of and speculate about, are here shown very clearly, and may be studied at one's leisure. With a simple magnifier enlarging to five diameters these little granular formations, composed of incandescent metallic particles, are observable which could not be seen by the eye in any other way, since with optical apparatus the heat and light would altogether prevent such examination. Thanks to photography, of which M. Janssen had been able to make such good use, it is possible to investigate the phenomenon without difficulty, and with a precision necessary to such important work. Already it has been found possible, by a simple examination of these impressions, to control in the most positive fashion the exactness of certain theories, and to establish in a most decisive manner that which was formerly a mere speculation.

M. Janssen has given some interesting accounts of the pictures he submitted to the attention of the members of the Photographic Society, and showed some fine enlargements of the sun. He exhibited (among other specimens) some pictures printed by the photo-glyptic process, representing enlargements of the solar disc. These latter are for illustrating the Annual of the *Bureau des Longitudes* for 1878, which is shortly to be published. Thus photography has become not only the most useful auxiliary of astronomical science, but permits itself to be printed in such a manner as to allow of distribution of copies in unlimited numbers. We cannot too highly felicitate the eminent astronomer on the applications he has made of photographic art.

In one of my former letters I spoke of the gayacine process, which M. Boivin had recommended, and which was suggested to him by the late Abbé Desprats; the gum in question being added to collodion. A skilful experimentalist in the provinces, to whom we owe personally many communications of an interesting nature—by name M. Flament—tells me that he has followed M. Boivin's process with considerable success. He is so satisfied with the results he has secured, that he desires all his brethren would give the method a trial. The collodion (of which M. Flament has made use with such favourable results) is composed in the manner following:—

Ether at 62°	...	...	...	55 c. c.
Alcohol at 40°	...	...	...	45 "
Pyroxiline prepared at a high temperature 8 to 9 deigr.	...	...	...	6 "
The double iodide of potassium and cadmium	...	...	...	6 "
Iodide of ammonium	...	...	...	4 "
Iodide of cadmium	...	...	...	4 "
Bromide of cadmium	...	...	...	4 "
Pulverised gum gayac (very finely crushed)	1 to 2	...	...	"

This collodion changes colour a little while after its preparation, but soon afterwards resumes its normal tint.

It is as well to allow it to ripen to some extent; nevertheless M. Flament has employed it with success three days after its preparation. The silver bath (acidulated with malic acid) is the same as that usually employed for wet plates.

M. Boivin (in his account of the process) recommends washing the plate in chlorised water after sensitizing; a weak deposit of chloride of silver (which is thus formed) acting as a preservative to the film. M. Flament supports this washing, which has the inconvenience of forming a deposit upon the film; but he washes the latter with ordinary water, and applies afterwards to the plate a salicylic preservative of a gallo-lead character, which was also conceived by M. Boivin. This preservative has the double effect not only of augmenting the sensitiveness of the film, but also of preserving it in good condition.*

In support of his communication M. Flament has sent a print from a cliché secured under the conditions he mentions. It is a view of a chateau situated in the middle of a park and surrounded by foliage. Every detail in the photograph is well rendered, and the exposure, we are told, was but four minutes at three o'clock in the afternoon in a clear weather. The lens employed was an applanatic instrument for half-plates, with a diaphragm of one centimetre. The focus of the instrument was twenty centimetres.

In a letter which I have just received from Captain Waterhouse, of Calcutta, he tells me that he is undertaking some experiments with the gelatino-bromide process, and that, so far, he has obtained very good results. He promises me (in an early letter) some details of his experiments, which I shall not fail to place before the readers of the *Photographic News*. **ERNEST LACAZE**

RETOUCHING.

BY NORMAN MAY.†

A STUMP, powdered blacklead, and mineral paper will found a great power with many under-exposed negatives, detail being put in dresses, lights in backgrounds, &c. Various other improvements not requiring that artistic touch that the face of the negative does. Retouching the pupil of the eye in, or rather taking it out, with a needle point is, too, a very risky business, necessitating a varnish perfectly under control, and that will not be liable to crack, chip, or peel off; a good eye, and light firm touch. It is much better for most retouchers to leave the eyes to be put in on the print, when they are easily be altered if not satisfactory, but the glare staring resulting from the pupil of the eye being removed from the negative, it is next to impossible to alter well the print. Putting the light in the eye is a totally different matter, much more easily done, and with judgment giving a very pleasing effect, having, moreover, the advantage that any little defect caused by doing much can easily be remedied in the print.

Pupils are sometimes put in eyes, and hair "stroked" with excellent effect; but to one success, with the majority of retouchers, there would be a hundred failures.

Very often, in Rembrandt portraits, a dark patch will be noticed on the shadow side of the nose, giving the appearance of either a twist, a bruise, or a hollow to that appendage. This, in the majority of cases, should be greatly softened—almost eradicated, in fact—and the nose made as straight and symmetrical as it would be in nature. People are not all blessed with straight, finely formed Grecian noses, but that's no reason why their retouched organ should be made a pug, or one that would be a disgrace to any but the most callous of prize-fighters.

Don't make a mistake and put a straight line of light down each side of the nose, as I knew an operator to do once, giving the subject the appearance of an Egyptian mummy that had been flat-ironed.

Lightening the deep shadows under the eyebrows

* See *Photographic News*, No. 1,000.
† Continued from page 564.

then make a wonderful difference to the likeness, causing the otherwise deeply sunken eyes to come forward and assume their normal appearance.

Putting detail in the moustache and beard will be found much easier task than the treatment of the hair. Hands are generally be improved by a little judicious touching, as no one cares to see their blue veins looking like knotted ropes spread net-like over the hands, as they often do in photographs.

If the collodion used in taking white drapery, dress, &c., is new and thin, and the picture fully exposed, every detail being brought out with a short development, the negative is generally be improved by strengthening the lights, and thereby making the shadows recede and be more marked.

Here, again, the knowledge of drawing is necessary, as ladies are very particular as to the fineness and pattern of their lace, which can be, and often is, entirely altered, and to them spoiled by touching "not wisely, but too well." Unless the retoucher is perfectly sure of the ground he is treading on, it would be better to do as little as possible on the face of the negative; but on the back, as a mistake would not be fatal, the pencil can be used to put in lights which, as they are broader and more diffused, would not be likely to destroy the pattern of the lace, but would still force up the shadows.

If possible, it would be better for the operator to manage such a case as this, as he would be likely to remember many little technicalities and details that a retoucher who had not seen the lady or dress would, perhaps, not notice, or, if he did, would pass over them as of no consequence; but to ladies, little defects and matters of dress that an operator or retoucher would think of no importance would be sufficient to spoil the picture and render it unrepresentable. How often has the photographer been annoyed, and sometimes a little bewildered, by a lady returning her proof with the remark: "I don't think it good at all, and none of my friends like it!" She doesn't know exactly what it is, but her friends say it isn't like her, or that the photograph is not up to Mr. —'s usual work; never dreaming of acknowledging that it is the dress in fault; but when she has her re-sitting, in nine cases out of ten it will be noticed that she wears another dress, or it has been gathered in at the waist or back, so that "that horrid wrinkle should not be perpetuated among her lady friends, who are such quizzers, you know."

A freedom from patches of light and shade is more to be aimed at than fineness of stipple. Some retouchers will work without the slightest appearance of granularity or coarseness, but still the face will look patchy, and not possess that softness and roundness of features which, whether natural or not, is liked by the sitter. I have now some photographs taken in Detroit, retouched more coarsely, perhaps, than a good English retoucher would care to do, but still with a degree of evenness that gives an infinitely better and more artistic effect than others that have a finer stipple, certainly, but the defects of the negative are still there, though softened. Not being at all an advocate for over-retouching, a relative of mine, or celebrity whose character of face I should wish preserved to the utmost, I would leave, if not wholly untouched, at least with the defects lessened, but not wholly eradicated; but for the general public I firmly believe that the better looking you make them, so in proportion will be your measure of success—financially.

People, as a rule, will not allow that they are flattered in photographs, and when some candid friend says, "The photos. are certainly like, but rather flattering," they will only give the photographer the more credit for taking the best view of their faces. "Don't pander to a vitiated taste," is a very good motto for a photographer whose sole aim is to produce faithful likenesses, but, other things being equal, it will be found that the man who pays attention to his retouching will succeed financially better than his non-retouching rival. Do not let me be supposed to

say that better likenesses were produced before the advent of retouching. Every photographer knows that yellow freckles hardly visible on the face will come out as black spots on the print, if not touched out on the negative. If these and the black lines resulting from a wrinkled face are natural, then retouching is unnecessary, but since they are decidedly unnatural, the retoucher is a great acquisition. Photographers now are enabled to make their negative much thinner, giving more harmonious and brilliant prints than before retouching was practised.

(To be continued.)

PHOTOGRAPHIC NOTES OF A JOURNEY ON THE CONTINENT.

BY AN OCCASIONAL CORRESPONDENT.*

My next visit was intended for the photographic establishment connected with the War Department. Following the direction given, I took a tramway going in the direction of the Bois de Cambre, and after half-an-hour's ride I was politely informed by the conductor of the spot where I had to alight, and when the tramway car disappeared I found myself among scenery resembling Hampstead Heath, less the castellated public-house. There was no regular road anywhere, but remembering that the obliging conductor's finger was directed towards the mass of huge black roofs, I went resolutely in that direction, till on some old gate of grey stone I, read in white characters, "Dépôt de la Guerre."

Here I began mentally to prepare myself to give some plausible excuse for my intrusion on that sacred ground, after the fashion at Woolwich. After I passed the gate, I saw before me a labyrinth of red-bricked house, but no living official to accept my excuses, or ask for the way. On my left I noticed a half-opened door with the inscription over it, "Compagnie Sedentaire." Through this door I perceived a dozen persons in military attire engaged in the very peaceful operation of peeling potatoes. I asked for the photographic department, but owing to the evident confusion of all the sciences composed of "graphy" in the mind of potato-peeler, I only came to the telegraphic department, and, after a fresh inquiry, came to the door with the desired inscription, and entering it, I found genial Captain Delaney engaged in some writing. Capt. Delaney went with me to the adjoining building, to see the chief of the Photographic Department, Captain Hannot, who was busily engaged in developing a large negative of a map.

After the negative was fixed, we went together to see the general chief of the dépôt, Major Adau, who had granted previously the permission wished, and now repeated it with his own lips, offering me to visit not only the photographic part, but all the dépôt without exception, and take all the notes I wished. However, having my object before me well defined, I strictly circumscribed my visit to photography only.

The photographic work produced at the dépôt is almost exclusively maps, consequently the dark room is not large, nor the apparatus numerous, but the printing part is very extensive. The process at present in use is the old-fashioned collodion silver bath, with pyrogallic development. Exposure is generally very long, but there is no reason to shorten it, and pyrogallic developer renders the image more intense and clearer in the shades.

After the negative is fixed, it is intensified by flooding it with copper-sulphate and bromide of potassium, followed with silver nitrate. Very interesting, however, and quite original, is the exposure. After leaving the dark room we climbed a little sand-hill, and on the top of it we found ourselves before a construction in red brick—small, low, flat-roofed, having as basis some geometrical figure, I think. Draped in front, there was an opening of exactly the

same shape as for a gun in a fortress, and in the shade of the embrasure I really perceived a big, shining, brass cylinder, but not of a gun. This was the largest rectilinear I ever saw of Dallmeyer's. We entered the interior of this casemate blindé, and there I soon became master of the mystery. In the embrasure was specially constructed, in very heavy iron, a stand being more resemblance to a heavy Krupp gun than to any other instrument. On this stand, very heavy and very firmly fixed, was a camera for a plate of twenty-four inches. In front of this formidable machine, in the open air, is stretched on suitable supports the hand-made map to be copied. A flap and pair of doors when closed protect the map from atmospheric influences. This arrangement is very immovable; but, the work required being invariably reduction to half, the camera once fixed is never altered. The stand is provided with all imaginable movements, but two men are necessary to manipulate it. In the same casemate there is another camera of small size, with Ross's doublet, but this is rarely used.

Photo-lithography and photo-zincography are the processes principally used for printing these maps, and the printing part of this establishment is most perfect. The system adopted is as follows:—A stone or zinc plate is covered with very thin solution of chromated gelatine, and exposed behind the glass negative in a suitable printing frame. (I omitted to notice in the proper place that the negatives are taken through the glass, in order to save them being reversed.) I observed that exposure of the gelatine plate, although it was a bright, sunny day, was eighty minutes, which, I think, is very long. The exposed plate is next inked all over with lithographic transfer ink, and immersed in a zinc trough filled with tepid water and some starch. All gelatine not exposed to the light will be dissolved in this bath, removing also the ink with which it was previously covered. More obstinate parts are helped with a sponge, while starch fulfils the duty of lubricator. Ordinary lithographic operations, such as acidifying and gumming, are next performed, and then the stone or zinc is transferred to the printer.

There is here a special building in which printing is done. A horizontal steam-engine, of eight-horse power, is the first object that attracts attention; next is a machine for surfacing the stones. In this machine litho-stone is subjected to a slow forward and backward motion, while a heavy cast-iron plate, at the same time rotating in horizontal plane, planishes the surface of the stone. There is an arrangement provided for the constant distribution of sand and water.

Lithographic presses were all busily engaged in pulling impressions of various colours. Some of the maps are printed in several colours. But the place of honour was occupied by a huge lithographic machine. The voice of Capt. Hannot has acquired a certain solemnity when he begins to describe the utility and perfection of this machine. I regret to say that for want of special knowledge of the subject, I cannot enter into details. I could only observe that all the iron parts were as bright as new, quite unlike some of the machinery in that metal in my possession. They were all, without exception, manufactured in Belgium, as were also the camera and stand previously described, which is an exception to the general rule.

(To be continued.)

THE COMPARATIVE MERITS OF DIFFERENT DRY PLATE PROCESSES.

BY NORMAN MACBETH, A.R.S.A.*

HAVING on more than one occasion called the attention of the Society to the probable advantage of submitting photographic prints for the inspection and opinion of our mem-

bers, and conceiving this to be a most likely way of conveying much information (the result of experience), I have much pleasure to-night in taking the initiative, along with Messrs. Muir, Panton, Murray, and Mathison, of submitting a few of our prints for this purpose.

Before doing so, however, permit me to state more particularly the object I have in view in this project, and the manner of going about it.

Although we have frequently had very good papers on special topics connected with photography proper from several of our members, yet there are many who, from diffidence, cannot be prevailed upon to write a paper, yet might, by the exhibition of their work, contribute the result of much valuable experience. Besides, it is not always the best work which promotes most knowledge; we, perhaps, after all, learn more by our errors than by our successes. There is so much apparent good work which is not the issue of good direction, but the result of a happy circumstance; and, this being common in the experience of photography, it is a good thing to know the reason—the why and wherefore—of such results. Now, the object of bringing out the minds of our members on these things surely is worthy of our pursuit.

I have no fears of the willingness of our amateur members to submit their works for this end; but it is probable that some of our professional members may at first be shy in the matter, fearing that it may be detrimental to their reputation; but I am convinced that if there be any party to profit most by such proceedings, it is the professional man. There are many very intelligent men amongst them who might do not a little good in helping others, especially beginners, out of many prevailing errors, and thus raise their own practice, and that of the whole profession, to a much higher platform than it has at present, more especially in its relation to Fine Art.

If such a proposal meet with the concurrence of the Society, I would (in the first place) have the management committed to the Council, whose duty it would be to secure the names of members willing to submit their works for criticism or otherwise, and also appoint the special evenings to be set apart for such a purpose. We cannot at first positively predict how such a project may operate, but I would suggest, in the meantime, that such meetings be held once a quarter, which would not be too frequent to affect the time of the Society for other duties.

I would not have it binding that we confine ourselves to the works of our members; but, considering the object we have in view—the increase of knowledge—I would by all means encourage any member to submit for our benefit any work which he may suppose contains something illustrative of a good quality, either in the science or art departments of photography.

On works being brought to the meeting they should be unpacked immediately, and handed round for inspection. After the ordinary preliminary business has been gone through, the first individual work should be taken up by the President, who would call upon the author or contributor of the work to make some explanation of the subject, and the special points on which he submits it for opinion. Other members might then be called upon for their criticisms until the subject is seemingly exhausted, when the next subjects (if any) are treated in a similar manner.

As to the spirit in which opinion should be expressed, I think there is hardly any need to say a word, although we may anticipate diversity of mind on several topics; yet I am sure that every member, whether professional or amateur, will carefully avoid all personalities, or any severe criticism tending to wound and not profit. Let us endeavour to have a strict regard to principles connected with the subject on hand, and the strengthening of good feeling amongst us, for the sake of our Society.

In conformity with the above plan, I now make my explanation as to what I submit at present. I ask your

* Read before the Edinburgh Photographic Society.

opinion on different dry-plate processes, and desire you to weigh their comparative merits.

With the exception of one or two impressions at the beginning of the scrap-book which I have laid on the table, most of the impressions were taken from negatives made during last vacation. They consist chiefly of collodio-albumen, collodio-emulsion, and gelatine emulsion; all the impressions are distinguished by notes at the side of each, mentioning the process, and the length of time in exposure. I cannot take up your time by dwelling on them individually; with the exception of one or two impressions from negatives taken between the years of '51 and '55, all the rest are first impressions (proofs, as it were); they have no treatment whatever, in sky, &c., and being so, I think they are of more value for our present purpose, many of the impressions indicating the useful experience of either over a short exposure.

Before I went to the country I received a very kind letter from Mr. Wardley, of Manchester, whose work in collodio-albumen gave us so much pleasure in our late Photographic Exhibition. Through the direction of his letter, I made several attempts, which I cannot say were without some profit, yet I must confess that, with the exception of one or two negatives, I did not succeed at all as I had hoped. But I must not blame the process: I was labouring hard to restore some old collodion by mixing it with some which was new, and though there was an improvement, I fear that this combination was the chief cause of my failure. I cannot say that (on this occasion) I ever succeeded in producing a negative without blistering during development—a too common complaint, I fear, in the experience of many with this process. An impression from my best negative by this process is now on the table.

The next dry-plate process which I tried was a collodion-washed emulsion, made by Mr. Turnbull (one of our members). With this I had no difficulty, and I seldom worked with any process in which I could do so with greater certainty. Its only drawback was the extreme length of time in exposure which it requires, necessitating at least twenty minutes under ordinary good light.

I need not describe its characteristics in action and results—the impression now before you speaks for itself; besides, the process is already well known with several of our members, some of whom have produced beautiful results, and specimens to-night by our esteemed Treasurer, Mr. Mathison.

I next tried an additional sensitising solution, applicable to any emulsion, by way of lessening the time of exposure. On applying this to Mr. Turnbull's emulsion, I found, to my agreeable surprise, that the time was reduced fully one-half. My information regarding this application was derived from the proceedings of an American Society, in which a Mr. T. C. Roche made the following remarks, and which will be found in the PHOTOGRAPHIC NEWS, July 6th, in a report of the proceedings of the American Institute: "Mr. T. C. Roche said that any good emulsion could be made to work more rapidly by first washing the coated plate thoroughly with water, and then flowing over it a solution of alkaline albuminate of silver, before exposure. The solution was made by using the white of one egg, two ounces of water, and a few drops of aqua-ammonia. To this was added enough of a thirty-grain solution of nitrate of silver to make the mixture milky. Then add ammonia again until the solution became clear. A few drops would be found quite sufficient to accomplish that. Before development, the plate should be well washed, and a ten-grain solution of bromide of potassium flowed over, then wash and flow on the pyro. The picture would show up quickly. Now add a few drops of am-

monia and bromide of potassium solution to the pyro, and complete the development."

I regret that the impressions from my negatives are not isolated, so that they might have been more thoroughly shown, because all that I have done by this application are in my scrap-book, and the best specimen is to be found in leaf 19, No. 2, "Ruined Cottages at Garelochhead." Most of the impressions by this process are, if anything, under-exposed, and I would say the proper time should be, with the single lens of a Voigtlander quarter-plate, not less than four minutes for sunlight and twelve for diffused light. Its tendency, like most processes under short exposure, is to be too dense in the high lights; however, the impressions referred to show what the process is capable of rendering under full exposure.

The next and last process which I now bring before you is one with which I have had but very recent experience, viz., a gelatine emulsion dry plate, as made by Mr. Peter Truefitt, a well-known photographer of this city, but I am sorry as yet not a member of our Society, which he should become. Having had my attention called by Dr. Nicol's remarks at some of our meetings to Mr. Truefitt's success in making a very sensitive emulsion, I was resolved to try it, and at once I got him to make me a dozen of half-plates. I was much pleased with the apparent very evenly-coated opaque surface which they possessed, but I was much more pleased with the result of my first attempt, as seen in the impression leaf 23 of my scrap-book—a portrait of my eldest son.

The time of exposure by a north light in my studio, with the window half-shut, was not more than fifty seconds. The quality of that photographic result from a dry plate, and taken in a room comparatively obscured, which, with a wet plate, would have required nearly two minutes, I am persuaded is a wonderful triumph. I cannot conceive anything more like the tone and quality of an old master; so sweet in the gradations, and rendered without any dodging or treatment of light—nothing but simply the source of light as led into the room from half a window. I am particularly anxious to call your attention to this—the importance of being able to produce the ordinary and every-day familiar effects of our dwelling houses, infinitely superior to the rapid effects of glass-houses never indicating the source of light. With such a dry-plate process—so sensitive—it is quite within the reach of securing effects under the most confined light.

I solicited Mr. Truefitt to let me show you to-night some of his negatives, believing that to appreciate fully their quality you must see them. One or two of them done in the open-air were almost instantaneous, others much slower, taken in obscure places, such as the abbey corner.

I had a great curiosity to test the power of this process in the copying of paintings, and was anxious to give you some idea of that to-night. With this view I sent up to-day a portrait which I had newly completed, so that Mr. Truefitt might try it. As you will all well know to your disadvantage, it has been extremely and unusually dark, the air charged with yellow and green and I know not what non-actinic colours by reason of the fog. He was very unwilling to try this, and sent a message that it was absurd to attempt it. However, in the course of the day he did try it, exposing the plate for half an hour. I now show you the negative. You will see that it is short of time considerably; but, nevertheless, as the colour of the deposit is very non-actinic, a passable print might be taken from it. I hope to show you an impression from the same subject, taken with good light, if possible, by next meeting of the Society. In case that I might not have the portrait with me then I shall now exhibit it, as it is necessary you should have some idea from what it has been derived.

The Photographic News.

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THE YEAR-BOOK OF PHOTOGRAPHY FOR 1878.

OUR Annual for the forthcoming year is now in course of preparation, and will be ready by the end of the present year. As our readers know, one especial feature we have established in connection with our own record of the year's photographic progress is the publication of the experiences of many able men; and we now appeal to our extensive body of experimental and practical readers for brief records of any interesting facts coming within their own experience and observation. We shall be greatly obliged by brief papers of this kind from as many of our readers as possible, and our gratification will be greatly increased if they will favour us with copy within five days from this date. We may here also appeal to our numerous advertising friends to favour us with early copy of their announcements, that the publication of the YEAR-BOOK may not be delayed.

PORTRAITS BY THE ELECTRIC LIGHT.

PROBABLY the most marvellous application yet made of artificial light to the purposes of photography has just been brought to a successful issue by Mr. Vanderweyde. We announced his discovery some months ago, and after the delays invariably attendant upon launching a new invention, he has now completed the working arrangements, and, in a handsome establishment in Regent Street, he is engaged from twelve, mid day, to twelve, mid-night, in taking portraits by the electric light. It would be impossible, from an examination of the pictures produced, to arrive at a conclusion that they were produced by artificial light. Instead of the harsh, chalky lights and black shadows without gradation, which experience associates with the majority of examples of portraiture produced by artificial light, these are, for the most part, remarkable for their softness and their singular perfection of gradation and modelling. Not only is every high light picked out crisply and precisely, but every gradation of half-tone is accurately rendered. The high lights are surrounded by delicate pearly greys, which remove all baldness and crudeness of effect, and the shadows are made transparent by the plenitude of reflected lights carrying detail into the deepest shadows. The portraits are, indeed, better, rather than worse, than the majority of those taken by the light of day.

It is scarcely necessary to repeat, as we have had

on former occasions to point out, that in a country like England, where for so large a proportion of the working hours of life sunlight is absent, but also where during the hours of daylight so many of them are characterized by fog and other atmospheric conditions, rendering photographic operations next to impossible, that any method rendering the portraitist independent of either bright sunlight or ordinary daylight must be regarded as a great boon, worthy of all consideration and acceptance. Many attempts have been made to utilize the various existing forms of artificial light, but, apart from the want of actinic power in many of them, their very form and conditions of existence have been inimical to the purposes of portraiture. As in noticing this invention before we pointed out, the electric light is nearly as rich in actinic rays as sunlight, but the primary difficulty has been in applying any artificial light so as to secure satisfactory illumination of the model, and to obtain artistic light and shade in the resulting picture. The conditions of an artificial light, consisting of a point or concentrated source, are opposed to the conditions of ordinary portraiture, in which parallel solar rays are, of course, always used. In a picture it is necessary to a satisfactory and natural presentment that the objects should be lighted as they are usually seen in nature, and this is not secured where an intense concentrated light is the source of illumination. And the usual results produced by the use of such lights has been at once unnatural and unpictorial. The lights have been harsh, chalky, and without gradation of detail; and the shadows black, dull, and without the transparency due to reflected lights by which the deepest shadows are relieved in ordinary daylight illumination. Reflectors of various kinds have been used to overcome these difficulties, and at times with some degree of beneficial effect, but not with sufficient advantage to bring them into practical operation.

It was obvious to Mr. Vanderweyde that, to render an artificial light of service in portraiture or pictorial work of any kind, it must be made to illuminate the subject in the manner familiar to everybody, and the divergent rays proceeding from a point must practically be converted into parallel rays, and the result of his experiments may be fitly described as a new system. The electric light, as most intense and actinic, is selected. Behind this is placed a concave reflector, the rays collected by which are passed through a large dioptric lens, on Fresnoy's principle, of nearly four feet diameter. The light passing through this lens gives the effect of a four-foot disc, or rather cylinder, of intensely actinic light, illuminating the sitter, who is literally bathed in light without being dazzled. The apparatus, consisting of lamp and large lens, is suspended a few feet from the sitter, and arranged that it may be moved all round him with facility, a white reflecting screen being placed on the opposite side of the sitter.

The sitting occupies from eight to ten seconds, and involves no trouble or discomfort whatever. The character of the negatives resembles those produced in a good light by ordinary sunlight, rarely requiring any intensification. A remarkable circumstance, the precise cause of which we cannot at present explain, is found in the fact that a singular softness and delicacy as well as fine modelling exist, rendering retouching rarely necessary, and then only in very slight degree.

Mr. Vanderweyde uses a Sieman's gas engine in securing his light, three-horse power answering his purpose. The somewhat costly nature of the plant for working this system is, perhaps, its chief drawback. Mr. Vanderweyde's first intention was to grant licences for the use of his system; but, in contemplating the limited number who would in all probability become licencees, he is at present undecided whether to follow this course, or confine its working to his own establishment—182, Regent Street. The fact that such a mode of working is a practical success is one of much interest to photographers.

A VISIT TO THE GROSVENOR GALLERY.

BY FRANÇOIS G. ELIOT.

HAVING been allowed, through the courtesy of the proprietor, to pay a visit to the private view of the winter exhibition at the above Gallery, I take great pleasure in recommending all my brother photographers and readers of your journal, who are not content with studying merely the chemical part of their art, to spend a few hours, when their business or hobby is at a standstill on account of the weather, in looking over this most unique collection. As a Royal Academician, who was present, was heard loudly to exclaim to a brother R.A.: "Here is indeed a goodly feast for the mind!" This collection, which has been brought together from the private portfolios of Her Gracious Majesty the Queen, and most of the art patrons of the nobility, consists not so much in finished paintings of the old masters, such as are to be found in the National Gallery and other art galleries of Europe, but are mostly the original sketches and designs for those noble works. Here we see the very mind and progressive thought of the great masters; and one thing must particularly strike everyone, the great labour and pains they took in elaborating not only the subject itself; but even every detail and separate portion received the greatest care and attention. In one frame (No. 715) lent by Her Majesty, we have studies of hands in all positions by Leonardo da Vinci; in another, by the same master, studies of feet; and in a third (No. 696) studies of drapery, which, being only in black and white, are worthy the attention of photographers, not only for their composition, but for their grand breadth of treatment due to their light and shade. We find studies of heads, busts, single figures, and groups up to the full compositions. These are not mere hasty sketches, but are finished drawings, and are perfectly stereoscopic in their effect and delicate softness.

We also see works by such masters as Guido, Correggio, Titian, Raphael, Rubens, and other well-known names, and can only regret that such valuable studies will have to go back to their noble owners, and will not be always accessible to students, like our national collection in Trafalgar Square. To those who like modern masters, there are sketches by Landseer and others, and finished works in oil and water by Constable, Catmole, David Cox, Stanfield, Hunt, Prout, and Turner. In wishing, therefore, every success to this fine exhibition, I cannot but pay a tribute of praise to the proprietor for his idea in bringing such a collection together, which might otherwise never have been seen by the general public, and also for his skill in selecting such a highly interesting and valuable set of art studies.

ON DENSE AND TRANSPARENT NEGATIVES.

BY JOSEPH LEMLING.*

THOSE who occupy themselves with photographic enlargements, and undertake work for other people, not unfrequently receive negatives which are well-nigh too dense for their purpose. A transparent negative, equal in fineness and delicacy to a denser one, is obtained surest and easiest (we allude to dry plate processes) when the action of the light is continued so long that a faint marking of the image is perceptible before development, so that a weak development, and the employment of little silver, is necessary. This manner of proceeding I have always recognised as the best when, either for enamel work or for enlarging, I am compelled to make use of a dense negative.

Have I, on the other hand, to prepare from a too dense negative, a transparent one, say for Lichtdruck work? I then make use of my fusible-pigment process, which I have perfected after many and tedious experiments. The process is simple and beautiful; by practice and skill some of the most magnificent results may be secured, and the process also does good service when from a weak and

very transparent negative a dense one is desired. All hitherto-employed processes of intensifying suffer more or less from the common defect that the intensifying of the blacks at the same time brings about a covering of the lights and finer lines, which, of course, should remain transparent.

Of the many instances in which simple unskilfulness or ignorance are the cause of flat and weak negatives I need not here speak, but only of those cases where a slight sketch, perhaps, upon a yellow ground has to be reproduced, or where from a combination of circumstances it is impossible for even a clever operator to secure a satisfactory result. In the case of Lichtdruck, or photo-lithographic work, it is not only unfrequent that weak negatives are sent in, from which it would be simply impossible to secure impressions capable of yielding clean and vigorous prints, especially as they are in a varnished condition. What is to be done in these circumstances is a question, then, which has been asked many and many a time.

If the negative is upon patent plate, or upon the convex side of a sheet of ordinary glass, then I have for many years past proceeded in the manner following:—

From the negative is taken, by placing upon it a dry plate, and giving a short exposure, a transparency; the latter would be more vigorous than the original negative, and from the transparency, by means of a second dry plate, another negative is produced suited to my purpose. The employment of these dry plates requires more skill than carbon printing. Long years of practice have shown me, however, that in this double printing upon dry plates, by reason of the unevenness of the two surfaces of glass, a good deal of unsharpness results, so that I have preferred to make the enlargements from very transparent negatives *direct upon paper*, and have used an enlarging apparatus of the simplest kind.

In the case of any negative, whether varnished or not, which lacks density and vigour, I employ upon the film any dusting-on process, modifying the mixture and application according to the weakness of the negative and the density I desire to impart to my reproduction. I can impart to a portion or the whole of the image any degree of density I like in this dusting-on process.

A BLUE PRINTING PROCESS.*

THE following process may be recommended for printing purposes:—

Float Saxe or Rive paper for from four to five minutes in a solution of citrate of iron. A tolerably well-saturated solution may be obtained by stirring the salt for a considerable time in boiling water, or by letting it remain for some time on the boil. The sensitized paper is then dried in the dark, and exposed under the negative till a feeble yellowish trace of the lines of the picture is visible on the paper. In summer five to ten minutes will be found sufficient, and in winter from thirty to fifty for the printing. The prepared side of the paper must be then drawn gently (for a few seconds) over a tolerably strong solution of red prussiate of potash, when with great rapidity there is developed a blue picture, which should be quickly passed through pure spring water, and if then not sufficiently strong, placed again for several seconds in the above solution, and then for a short time thoroughly well washed. An over-exposed picture develops so quickly that there is hardly time to wash it before the lights begin to tone.

This process of blue printing is of great importance to engravers, who restore by it the stencil for the pantograph. Also for enlargements, wood engraving, &c., it is very useful, and can be worked at a fabulously cheap rate. By washing the picture when finished in water to which a little ammonia has been added, it will appear more of a violet tint.

* Photographische Correspondenz.

* Photographisches Wochen-Blatt.

ARTISTIC LIGHTING AND THE GENRE CALLED REMBRANDT.

BY M. SCOTELLARI.*

The plate being previously varnished (gum-lac we prefer), it must be made rough by means of rubbing with the finger, on the part which requires retouching, some powdered pumice or cuttle fish powder, which may be removed by means of a badger brush. The plate is next placed in a retouching-desk, and worked upon with a well-sharpened Faber's No. 2 pencil, which takes well on the roughened varnish. All spots or wrinkles on the visage are removed, and the features are softened and corrected. The places which have been retouched must be made imperceptible by transmitted light by means of a stamp of grey paper.

The white points are removed with a brush wetted in some white of silver and Indian ink, mixed in such a manner that it would resemble the tint of the plate.

The hair which should appear light that the photograph gives dark, can be lightened with grey paper stamp and some Conte's blood-coloured.

It is true, the photographs please the customers; but we, with our artistic branch, as with other branches, must try to teach the customers to appreciate our artistic skill and contribute to its success. Sooner or later, common people will finish by appreciating the works of merit, and photography will take the dignified place to which it is entitled in the artistic sphere.

It is desired the retoucher interpret this half artistic work with much prudence. For less than a Tintoretto or artist of an equal merit, you must consider the retouching a negative as a kind of toilet, and leave the character of every person to the photographer. For instance, persons being in undress in the morning, especially on the Sunday, they shave and wash themselves, change their linen, put on new clothes, and soon you see them under another aspect. But their resemblance is always the same, whilst the greatest numbers of photographs are massacred by some photographers who remove all and not leave more than the eyes and part of the mouth; the rest is round.

Correspondence.

ARTISTIC EFFECTS A LA REMBRANDT—ANSWER TO MR. ROBINSON.

SIR,—No; M. Scotellari doesn't claim too much; he only claims what is due to him. Mr. Robinson makes a mistake if he supposes that, in referring to the application of supplementary lighting for effects called *à la Rembrandt*, I had the idea of making a commercial business for my patented Opturateur Sensible. I do not ignore what has hitherto been done by others; but to whom shall we attribute the merit of first applying the system of lighting? It will embarrass anyone to answer this question.

For myself, I not only claim, but I particularly affirm that I tried to introduce it into England in 1871. There are professional gentlemen in London and Brighton who can confirm my statement. If my name was not then, as now, to be found in the PHOTOGRAPHIC NEWS, the reason is that I then kept the system secret for my speculative objects, and now I make it public in the interest of all, after having seen that England is (more than any other country) attracted by the kind of portraits called *à la Rembrandt*; and there are comparatively few photographers who are able to gratify the taste for them.

I don't know if, when Mr. Robinson speaks of pictorial effects, he means the palette of the painter or the cliché of the photographer. Under any circumstances the date 1868 is still recent. A great number of artists (to my knowledge) used this system of lighting many years before, amongst whom M. Nadar, of Paris, who, about the year 1860, pro-

duced his illustrious literary and artistic contemporaries; his collection is well known. But the retouching of negatives not being practised, this kind of work was not generally appreciated. M. Grille, of Naples, made it a speciality with the retouch, and he had a great demand for it. Ferretti, of Rome, produced large heads very much like those of Rembrandt. Many others used it at the same period—some with a knowledge of the matter, others by pure chance. Mr. Adam Salomon, at the Annual Exhibition of Paris, exhibited portraits of this kind, which, with the help of the retouch, attracted the attention of many people. Gans, of Zurich, Tetschler, of St. Giles, especially practised it before it became generally known, and many others whose names I omit for the sake of brevity.

I repeat here, that together with these gentlemen I made it known to many photographers in the following places, viz., Paris, Lyons, Marseilles, Nice, Menton, Lausanne, Geneva, Vevey, Barcelona, Madrid, Saville, Algiers, Cadix, Lisbon, Belgium, and Germany; and whose names I am ready to show. Many of these photographers have drawn and still draw a nice profit, both commercially, and in the form of medals from the various exhibitions.

As to the interrogative way of reasoning of Mr. Robinson, when he puts the question, What will M. Scotellari claim? I must make some other remarks. There are in England, Germany, and elsewhere, people who pretend to impose themselves by the title of Doctors and Professors; and on account of their facility of communicating with the press, always take the word, and sustain theories which are believed by them to be absolute. And if a practitioner has something to show (however good it may be), they always contradict it as doubtful and confused. That is their own profession.

SCOTELLARI.

WILL THE PHOTOGRAPHS EXHIBITED IN 1877 SHOW QUALITIES OF PERMANENCY IN 1878?

SIR.—The past photographic exhibition having been so satisfactory in point of numbers and general excellence, many suggestive thoughts occur, some few of which may be named for the consideration of exhibitors themselves. Observations were made which I have not seen in reviews of the exhibition:—1. As to the general harmony of the pictures with each other. 2. The massiveness of tone; it seemed to force exclamations from visitors at the depths of toning. 3. It was frequently remarked that the photographs were much more deeply toned this year. Persons had their attention directed to the exhibits; even in the works of those artists whose aim is supposed to be to have a light and constant style, there seemed also to be a tendency to depth. One is tempted, therefore, to inquire whether the producers, by a conscious view of exhibiting, gave more force than usual to their productions. The fact, however, was that many of the pictures—perhaps the majority—were so deeply toned as to show very great uniformity and harmony, with great force of tone and colour. Those who might prefer rich brown photographs had all gradations, to rich claret, chestnut darkness; and exhibitors who preferred cool greys came strongly out by contrast, while tending in tones and vigour to blackness, as if the photographs were to vie with engravings.

It becomes a fair question whether the tendency to darkness and blackness in many carbon subjects may not have influenced, perhaps quite unconsciously, the production of deeper-toned silver prints for exhibition, and this fashion—if fashion there be—in the rich hues of the productions shown this year.

It is just such questions as these that, I presume, give peculiar value to exhibitions; and if fashion prevails, then true estimates can only be formed by comparing works produced by different persons in situations where there can be no strict identity of light, periods of time, chemicals, modes of working, and display.

Having thus named this one point of the obvious intensity of these photographs, there comes the ever-recurring idea as

* Continued from page 541.

to their permanency; and I suggest whether some interesting facts may not result from watchful care, and examination, from time to time, of these exhibited pictures, and even to report at given periods on their permanency, or their changing, or their decaying state—say within a year from the date of their production or of exhibition. It appears to be a natural desire to know if these carefully-prepared pictures keep their pristine brilliancy and vigour, or if they show the sickly symptoms that perplex and sadden the photographer and the philosopher.

Of hundreds of valuable pictures prepared for exhibition, their history must be well known; every point has been considered, estimated, and, it may be, well remembered. It will be gratifying, indeed, if the ready report can be made that they remain permanent, or that any changes may have traceable causes assigned. As there were hundreds exhibited, so there may even be hundreds more that were prepared for exhibition, and these also afford ranks of witnesses to the effects of time and other influences on their existence and pictorial value.

In the exhibition I saw no glaring case of tendency to fade; if any such are known to the artists, then, comparing such appearances with the date of production, known only to themselves, it will be in the power of the photographers to furnish profitably a report on the pictures. I presume that the photographic societies and the photographic journals will readily be available for such reports on the pictures. It will be a grateful epoch in history if, after all the literature of doubtful value on the fading of photographs, there should by improved practice be the happy response that the silver prints and pictures are but little changed, are good, or remain permanent, that were prepared for the London Exhibition of the Photographic Society of 1877.—I am, yours, &c.,

THOS. J. FRASER, F.C.S.

THE PRICE OF SENSITIVE PAPER.

Sir,—Will you allow me a small space in your valuable paper. As at present many wholesale dealers are offering sensitive papers to the profession, being the time of the year mostly used, I think if the wholesale houses would come down in price, to say 10s. 6d. per quire, and give us a genuine article that would keep, say, for one month, at that price I don't think there are many photographers who would bother about sensitizing their own papers, but would much prefer buying paper already sensitized; that is, of course, if its qualities could be relied on.

No doubt some of the wholesale dealers will have an opportunity of perusing this letter, and I have no doubt they will say it will not pay them to do it at the price. I mean to say I believe it will pay them, and pay them well; for where they now sell quires they would then sell half reams. As you are aware, the prices of paper average 5s. to 5s. 6d. per quire, or £5 and £6 per ream, and as twenty-four sheets of paper can be silvered with 1oz. of silver, and the price of silver (to go into figures) is 8s. 3d. per ounce in quantities, and say 8d. per quire for gas and acid, &c., this would bring it up to 9s. per quire, which would leave 1s. 6d. profit per quire for labour, besides selling more paper; and with two whole sheet dishes, one quire an hour could easily be done, or would go so far as to say a good hand would do a ream a day. It will be a great boon to the photographers, and saving of time, more especially at this time of the year, and I certainly think that much more paper would be used than is at present, whereas the printer comes of a morning and asks how much paper to be silvered—it may be ten or twenty sheets, according to the weather—if it should prove fine, that lot in large prints can be easily run through, and in many instances hours are lost in a day by having two or three or half a dozen negatives out to finish up, being too late, perhaps, to do any more, for fear of a wet day to-morrow, when if it was kept in stock already, there need be no stopping, and printing commenced early, and print as long as there was light. As far as I am individually concerned, my printer is always afraid he is going to silver

too much. This is to say nothing of the loss of time, which is of great importance of a fine morning.

Also a great boon it would be to the photographer who is in a smaller way of business. Two or three days' printing could be done at this time of year, and of a wet day the toning might be done, or it could be left for a week or more if on a push. Of course, in all instances, postage or carriage of papers to be charged extra. I think if the profession could really depend on the paper, they would order at least one quarter of a ream or half a ream at the time. I will leave the matter in the hands of those in the trade. I should in the meantime like to hear any suggestions from our brother photographers.—I am, yours, ANASTAS. NIX.

SLIGHT WASHING AND PERMANENT PRINTS.

DEAR SIR,—Will you allow me a space in the News to relate a curious incident which happened some five years ago. I did some photographs of a lady going to India, and she required a print mounted, &c., in one hour's time, but I said it was impossible, as it would not last when finished. I was, however, persuaded to do it. I then toned it in acetate bath, and fixed in hypo. (usual strength), and had five minutes to wash it in. I gave it about three minutes of running water, and then I laid it down on the floor (mounted), and, placing a cloth over it, I passed several times a hot ordinary iron over it. The other day a lady called, and showed me a print, and asked if I could copy it. I said yes, and discovered in this print the one I have just been speaking about. It was as white as when I sent it out five years ago, while the others I sent after many hours' washing showed evident signs of the yellow fever. What does this mean? I cannot say, but I leave it for my more scientific friends to discover.—Yours very truly,

Landthorne Hatch, Farnham, Surrey. C. R. P. VERNON.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held on the evening of Tuesday, the 11th instant.

Mr. V. BLANCHARD (in the absence of the President through illness) occupied the chair. The minutes of a preceding meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Messrs. W. F. Hobson, A. Hill, E. Brightman, and Brooker.

Captain ANNEY, R.E., F.R.S., then read a paper on "Bromide Emulsions," and showed some experimental plates illustrating points in his paper. As the discussion apart from the paper would be uninteresting and scarcely intelligible, we shall delay a full report until next week, when the paper will also appear.

Mr. W. BEDFORD showed some good emulsion negatives, but considered the process very slow. In answer to questions, he thought his plates required an exposure ten times as long as wet plates.

Mr. HANNEY detailed an experience when one of his own bromide of zinc emulsion plates, one of Mr. Warnerke's emulsion plates, and a wet collodion plate were tested; they were each exposed for five seconds with a Dallmeyer's stereo. lens, and the results were as nearly as possible precisely similar.

Mr. KENNERT, in reply to the Chairman, found his gelatine plates as sensitive as the quickest wet plates, and the development took from three to five minutes.

Mr. ENGLAND found emulsion plates nearly as sensitive as wet, but not quite. Development about the same as wet.

A paper by Mr. Viles, on "Micro-Photography," was announced for the next meeting, and the proceedings terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held at the Society of Arts Rooms on the evening of Tuesday, December 6th, the Rev. F. F. STATHAM, M.A., in the chair.

The minutes of a previous meeting were read and confirmed,

and the following gentlemen were elected members of the Society: Messrs. Frank Bishop and E. W. Stowel.

The SECRETARY then read the following

Report of Committee.

Your committee, in presenting the annual report for the session of 1877, congratulate the members of the South London Photographic Society upon the character and amount of the work which has been brought before their notice, and which, having been of an exceedingly practical nature, has afforded the members occasions for conversational discussions; and these being one of the most valuable portions of your Society's sphere of usefulness, your committee express the hope that young members will avail themselves of the opportunities thus offered for acquiring practical information from their more advanced brother experimentalists. At the same time, your committee throw out a suggestion that, as tending to develop still further this branch of the Society's proceedings, it would derive much aid if short papers could be read upon comparatively little matters, upon which the experience of others, through these conversational discussions, might be made useful to all.

Your committee are pleased also to have to offer congratulations upon the result of this year's Technical Exhibition meeting. The opportunity for new ideas and inventions to be thus brought before the notice of the photographic world is all that your Society can do; the result must entirely depend upon inventors, who are freely invited to make known their productions. At the same time, the institution of such a meeting is entitled to support, and worthy of success.

The following papers have been read during the session:—"The Collodio-Bromide Process applied to Transparencies and Enlargements without a Nitrate Bath," by W. Brooks; "Collodio-Bromide Emulsion," by P. Mawdsley; "On Drawbacks," by E. Dunmore; "Photographic Difficulties," by F. York; "The Nitrate Silver Bath," by B. J. Edwards; "Spots in Emulsions, their Cause and Remedy," by W. Brooks; "Educational Aid by Photographic Exhibits," by T. J. Pearsall, F.C.S.

Mr. W. Brooks made a communication respecting experiments he had made with a magnet for the production of a photographic image.

Mr. WARNERKE gave a description, and demonstrated the action, of bromide of copper as an intensifying agent.

Photographs.—Transparencies, new inventions, and appliances have been exhibited by Messrs. Brooks, Ayling, Fernely, Cutchey, York, Warnerke, Lane, Pearsall, Bolas, Baynham Jones, Reeves and Hoare, Dunmore, Aldridge, Ayres, Cocking, Taylor, Penny, Allan, Clarke, Harrison, Dallas, Woodbury, and Wright and Co.

In conclusion, your committee hope that as the basis of your Society's success is built upon the amenities of social intercourse, where the good of others is considered beyond the individual, so they trust the Society may go on prosperously in its mission of practical work, and that the forthcoming session may be valuable in new ideas and fresh developments of existing facts.

The report having been received and adopted, the election of officers was proceeded with; and after a vote, by which it was decided to retain five vice-presidents, instead of reducing the number to three, the following officers were elected.

President. Rev. F. F. Statham, M.A., F.G.S.

Vice-Presidents: G. Wharton Simpson, M.A., F.S.A., Jabez Hughes, F. Howard, W. Brooks, P. Mawdsley.

Committee: Messrs. Aldridge, Ayres, Dunmore, Fry, Nesbit, Warnerke, and York.

Treasurer: F. Bridge.

Hon. Secretary: E. Cocking.

Mr. LANE exhibited an ingenious portable camera with several points of improvement in convenience, portability, and rigidity. After some conversation, and votes of thanks to the President and officers duly passed and acknowledged,

Mr. FOXLEE proposed and Mr. Brooks seconded a motion empowering the members to elect honorary members. This motion being carried, Mr. FOXLEE proposed the election of Mr. P. Le Neve Foster in that relation. This was carried, and Mr. Pearsall was also elected an honorary member. After some other desultory proceedings the meeting terminated.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Board of Management of the above Association held their monthly meeting at 160A, Aldersgate Street, on December 6th.

After the minutes of the previous meeting had been read and confirmed, Mr. BOLAS proposed, and Mr. HALL seconded, "That

Mr. Massey be elected an ordinary member of the Association." Mr. Cussons was enrolled as honorary member.

The Annual General Meeting was decided to be held on Wednesday, January 2nd, 1878, at the office of the Association, when it is hoped a large attendance of members and their friends will take place. The chair will be taken at eight p.m.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second ordinary meeting of the session was held in 5, St. Andrew Square, on Wednesday evening, December 5th, Mr. W. H. DAVIES in the chair.

The minutes of the previous meeting having been approved, the following gentlemen were unanimously elected ordinary members of the Society:—Messrs. John Bonar, J. D. Adams, Wm. Halkett, Wm. Cowan, Kirkwood, James Coutts, Michie, Wm. Mathieson, J. G. Goodman, and Mr. James Pillans, Jun.

Mr. NORMAN MACBETH, A.R.S.A., then read a paper on the comparative merits of different dry plate processes, exemplified by the studies of several amateur members of the Society (see page 592).

The paper was illustrated by a number of negatives produced by many processes, from the old calotype to the most recent gelatino-bromide methods, extremely varied subjects being represented, from the ancient and massive monuments of Egypt to the quiet shady nooks in an old Scotch kirk-yard. Neither was portraiture wanting, as some most successful portraits were shown, possessing all the qualities so much appreciated by the artist as distinguished from the photographer, and these by means of dry plates, in an ordinary room with half the window blocked up, the time occupied not being longer than that required in the photographic glass-house.

Mr. W. NELSON, in referring to gelatino-bromide plates, remarked that Mr. Gray was the author of the process, he having experimented on it for years past, and worked it out to its present high position. So sensitive had he found Mr. Gray's plates, that by an inadvertent exposure of three seconds he had found the plate spoiled by over-exposure. He congratulated Mr. Macbeth on the very interesting and instructive matter brought forward, and considered the exhibition of failures in juxtaposition with non-failures was a very happy thought, and concluded by remarking that he who says he has no failures is in himself the greatest failure of all.

Mr. ALEX. MATHIESON spoke to the high sensibility of the gelatino-bromide dry plates, and showed the negative of a horse which had been most successfully obtained by an exposure of six seconds, using a rectilinear lens. He remarked that a novice was liable to be much deceived by the character of the films, for so very non-actinic in colour were they, that what would usually be deemed a mere "ghost," was found to produce the most brilliant results when printed. In exhibiting a number of collodio-bromide negatives of exceptionally good quality, he took occasion to remark that whether the bromide were suspended in gelatine or collodion, the plates showed a remarkable immunity from all the stains and other defects so common in many other processes.

Dr. NICOL said there was hardly a limit to the sensitiveness of Mr. Gray's plates. The only thing to be guarded against was admission of white light to the plates in any stage of their production; the fogging that some complained of was wholly due to the admission of too much light in the dark room. Absolutely clear plates, even with the most sensitive films, could be produced with certainty if due regard were paid to this particular. So well satisfied were some professional photographers who had tried it, that they had bought the method of production from Mr. Gray, and in more than one case the bath had been wholly superseded by these dry plates, even for ordinary portrait work.

Mr. ANNAN thought very highly of Mr. Gray's process. He understood the inventor claimed the introduction of a distinctly new and original ingredient as a special feature of his emulsion, and it was to this particular material, which was used in large quantities, that he ascribed the keeping qualities and the exalted sensitiveness of the emulsion. In his experience he found it much easier to coat large plates with gelatine than with collodion.

Mr. DAVIES elicited the information that "cockling" or "buckling" of the edges, and blisters, were quite unknown with these plates, and that whenever these defects occurred in any process, it was due to a peculiar quality of the gelatine employed.

Some of the prints furnished by Mr. Murray in illustration of Mr. Macbeth's paper also showed the relative merits of several methods of printing. Prints by the collotype, zincographic, and other fatty ink processes were exhibited alongside of silver prints from the same negative; this was a very interesting feature. One print from a calotype negative of the ruins at Luxor, by Mr. Murray, printed by Colonel James, of the Ordnance Survey, Southampton, was specially noticed.

Mr. DAVIES exhibited a magnificent copper plate twenty-one inches by sixteen inches, produced from one of his negatives—a reproduction of an oil painting by Mr. Norman Macbeth, A.R.S.A., together with a print on plate paper from the same. He said its origin was due to the late Edinburgh Photographic Exhibition, at which the exceedingly beautiful productions of Messrs. Goupil were so much admired, and for which one of the silver medals had been awarded. He felt a peculiar satisfaction in exhibiting this, the first of its kind that had reached Scotland. The resulting prints were so very satisfactory that other artists of eminence had already decided to have their pictures reproduced by this photo-gravure method. The plate and print were examined with extreme interest, and Mr. Macbeth, in reply to queries, stated that the plate only appeared touched by the graver in those points where the light had caught the particles of dust, &c., adhering to the surface of the painting. He thanked Mr. Davies for submitting such an interesting production to the criticism of members, and said that no engraver could have reproduced his picture so perfectly, for when an engraver copies a picture he merely translates his idea of it, the result being in a totally different language; whereas in the example exhibited there was the absolute reproduction of the individuality of the artist, and he could not conceive of anything more valuable than this.

Mr. DUBIE said he had made many attempts to produce copper plates by electro-deposit on impregnated gelatine, and the only difficulty he had to contend against was the action of the bath or vat of sulphuric acid on the tender film; if he had any means of overcoming this, he was certain that copper plates could be prepared at a very small cost.

A fluid lens by Archer was presented to the Society by Mr. Wilson, of Aberdeen, through the President. The historic relic was examined with much interest. It will be placed among other treasures of the Society, suitable rooms for which, it is hoped, will shortly be provided.

Mr. MACBETH next paid a graceful tribute to the memory of the late Mr. Alexander MacGlashan. He said that the Society should not not allow this meeting to pass—seeing it is the first which has been held since Mr. MacGlashan's decease—without paying a tribute of respect to his memory. From the commencement, not merely of this Society, but of photography itself, Mr. MacGlashan took a most prominent part in following and contributing to the progress of each. Being of a highly inventive and mechanical turn of mind, he did much in the way of improvement in the construction of cameras, chemical apparatus, and certain types of photography with a view to printing purposes. He was among the foremost (after Messrs. D. O. Hill and Adamson) to put the size and style of their calotype portraits into prominence by the collodion process. The Society would long remember the impression which these portraits made on the public at large, composed with a simplicity and grandeur which made them stand by themselves as works of art. Mr. MacGlashan was well known in his profession proper, being for many years the first copper plate printer in Scotland. He (Mr. Macbeth) had personally a most pleasing recollection of the kind and obliging manner in which the deceased met the wishes and tastes of artists and engravers, in producing with the greatest pains a true rendering of their works. The self-sacrificing disposition in devoting his fertility of resource for the benefit of any who sought his advice or services was a marked feature in his character, and would be long cherished in the memory of all who had the privilege of his acquaintance. Mr. DAVIES, Mr. ANDERSON, and others, spoke to similar effect.

Votes of thanks to Messrs. Macbeth, Murray, Mathieson, Davies, Wilson, and the Chair brought a peculiarly interesting meeting to a close.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Society was held at the usual place of meeting, the Museum, Queen's Road,

Bristol, on Wednesday, December 5th, Mr. G. WEBBER in the chair.

The minutes having been read and confirmed,

The CHAIRMAN called upon Mr. E. Brightman to exhibit the new pyro-hydrogen light for the magic lantern. The examination of this new and most simple arrangement for a very powerful light was very interesting, the light being nearly, if not quite, equal in intensity to the oxy-hydrogen light.

Mr. DANIEL passed round for examination one of his negatives, the varnished surface of which presented a very peculiar appearance. There seemed to be a perfect network of a very fine mesh completely covering the negative. It did not exist below the varnish, nor, Mr. Daniel affirmed, did it in the slightest affect the printing. He said the varnish was some made by a friend of his, an amateur, and which was considered so excellent in quality that many of his friends used it in preference to any other. He should like to hear the opinion of the members present as to the character and result, if any, of the marks.

Lieut. LRSAGHT did not consider the markings, cracks, or, rather, very minute folds, through expansion of the varnish, consequent on the gum in it not being properly balanced. He recommended removing the varnish by exposure to alcoholic vapour, and re-varnishing.

Mr. BRIGHTMAN considered that rather dangerous, and proposed immersion in preference.

Mr. DANIEL said that, unfortunately, many of his finest (including prize medal) negatives showed symptoms of the same state of things, some being equally strongly depicted.

It was generally admitted to be a most extraordinary appearance.

A vote of thanks to Mr. Brightman closed the meeting.

BERLIN PHOTOGRAPHIC SOCIETY.

A MEETING was held on the 6th inst., C. BRASCH, Esq., in the chair.

The minutes of the last meeting having been read and confirmed, a vote of thanks to Mr. Greenwood for a copy of his almanac was passed.

The CHAIRMAN then laid before the members a beautiful collection of micro-photographs, made by Mr. Grimm, of Offenburg, and presented by him as an addition to the collection of photographs of the Society. They were examined by the assembly with the utmost attention, and declared to be first rate work.

Mr. ERNET DUBY then read a paper treating on Heliogravure, and the Different Phases of its Development. He showed how from the first beginning of our art there had been a tendency to substitute for the rather troublesome and expensive work of ordinary printing from the negative on albumenized paper, a method that would allow the production of pictures on lithographic stones, or metallic plates. The first patents in connection with such a method had been granted to Messrs. Lemerrier, Lerebours, and Barresville, in the year 1852. Mr. E. DUBY then proceeded to demonstrate this first method of photo-lithography, and exhibited a portrait of a member (Mr. William Werner), the chief of the photographers of the Royal Printing Establishment (Königliche Staatsdruckerei), done by this method in the year 1852. A common lithographic stone, after being carefully polished, was grained by some sand and water, so as to enable it to produce pictures from nature. Afterwards, a solution of asphalt in oil of turpentine was mixed with some drops of a solution of nitrate of silver in oil of turpentine. Notice was called to the circumstance that not much of the nitrate would be dissolved in the oil, and, moreover, that the act of dissolving required several weeks of time. This mixture was carefully spread over the stone by means of a roller. When dry, the stone was exposed to the light under a negative, which generally took from one to three days, whereupon the picture, that would be already somewhat visible on the stone, should be developed by a sponge dipped into some turpentine and linseed oil. It would soon appear very distinctly, and with considerable force. The stone must then be etched, whereupon (the remainder of the asphalt having been removed) it might be inked and printed from. Mr. DUBY exhibited a lithographic stone prepared by him in this manner, in which the members showed great interest. Further particulars will appear in our next.

Mr. H. BOCK, photographer to H.R.H. the Prince Frederic Charles, exhibited a new apparatus invented by him for doing reproduction work. This apparatus consists in a box fixed on a sort of movable gibbet, fastened to the camera-stand, and which can be turned horizontally. If it be wanted to reproduce a carte-

de-visite or a cabinet card (that is, a positive picture), the same may be fastened to the box and covered with a clean glass plate. If it be required to reproduce a negative in order to obtain a diapositive, the box must be turned round on its axis, the negative fixed on it by means of two crotchets, and then a sort of bag, fastened to the box, will be drawn over the objective, so as to retain all superfluous light. The apparatus may be turned in every direction, and will always remain steady.

The members unanimously agreed that for reproductions this apparatus was the best and most convenient hitherto exhibited.

Mr. CARL FRICKE exhibited some copies that he had varnished by a particular composition of wax and other substances. He did not, however, reveal the secret of the composition.

The meeting considered that though by the use of this varnish the appearance of the picture was greatly enhanced, that, by the so-called *heiss-satinir maschine* (hot burnishing machine), the same effect might be produced, and that the pictures were not so liable to injury by scratches as often happens when they are rubbed with the wax or similar compositions.

Mr. TH. TOOP stated that for hot burnishing it was not absolutely necessary to have such a machine, and that he had found an old common burnishing machine quite sufficient for this purpose.

Moreover, it was agreed that on pictures rubbed with these varnishes the retouching would soon afterwards be visible, by which they lose their value.

Messrs. BRAUN and Co., at Dornach, had sent in a beautiful collection of carbon prints, reproductions of statues, paintings, and landscapes (original). They were examined with all the admiration due to the productions of this celebrated firm.

Mr. H. BIRFELDER, of Peru, forwarded a beautiful collection of Swiss views as a present to the Society.

Mr. H. TOOP, a gentleman known in Germany as a first-class photographer, declared these landscape pictures to be the most excellent he had ever seen.

Among them there were some ice mountains, parts of the Swiss Jura Railroad, and other interesting sights. As to the ice mountain pictures, it was particularly interesting to see that some of them had been taken at an elevation of about ten thousand feet, and they must have been taken with a good deal of difficulty and hard labour.

The members requested the Secretary to send their best thanks to Mr. Birfelder for his friendly gift.

Mr. F. U. BENKENDORFF exhibited a fine collection of Licht-drucks done by Mr. W. Hoffmann, of Dresden.—E. DUBY.

Talk in the Studio.

PHOTOGRAPHING A TROTTER HORSE.—*The Druggists' Advertiser*, noticing the feat in San Francisco of photographing a race-horse while trotting at the rate of thirty-six feet in a second, says that during the exposure the rider's whip did not move the distance of its diameter.

A NEW AUTOGRAPHIC PROCESS.—In the Belgian *Bulletin du Musée*, M. Hannot describes the following new autographic process. The writing or drawing is made upon any kind of paper, which should, however, not be very thick. A special ink is used, composed of gum-arabic or gelatine $\frac{3}{4}$ ozs., water saturated with bichromate of potash one quart, and sufficient Indian ink to colour the whole. The gum is first dissolved in the solution, and the ink afterwards added. The preparation must be kept sheltered from the light, and when used a portion should be poured out in an inkstand of black glass. When the drawing is finished it is exposed to light, whereby the lines are rendered insoluble. A plate of zinc or a stone is then prepared and polished with emery, and the drawing is placed upon it face downward. Above the latter is laid a sheet of paper covered with gum-arabic, and above this two or three sheets of dampened blotting-paper. The whole is then pressed. The moisture in the blotting-paper reaches the gummed paper, and the gum, dissolved, traverses the autographic paper and affects the zinc or stone everywhere except where the insoluble lines of the design have prevented its passage. A roller of greasy ink may then be passed over the plate, and the grease will adhere only to the lines which are not covered with moisture. Printing is then done in the usual way.—*Scientific American*.

TO MAKE COMPOSITION ORNAMENTS FOR PICTURE FRAMES, &c.—Mix whitening with thin glue to the consistence of putty. Have the mould ready, rub it over with sweet oil, and press the composition into it. When a good impression is produced, take it out and lay it aside to dry. If it be desired to fit the

ornament to a curved or irregular surface, apply glue, and bend it to the place where it is to be attached before it gets dry.—*Scientific American*.

To Correspondents.

H. B. FRANKLAND.—Large dishes may be made of well-seasoned pine. They may be treated inside thoroughly with paraffin, which will make them water-tight and non-injurious to solutions; or they may be well pitched, or treated with shellac varnish. A very clean-looking interior is made by first lining them with cart-ridge paper put on with paste, and, when dry, varnished either with shellac or a mixture of plain collodion and boiled linseed oil. The lining has an advantage in showing the presence of dirt at any time.

AMATEUR.—Does the film-splitting to which you refer occur in producing the picture, or in the varnished film of the finished negative? We think, from your allusions, it is the latter. Storing the negatives in a damp place or in a damp atmosphere is the most common cause; sometimes it is due to insufficient rinsing after fixing. Sometimes a bad varnish is the cause.

A FRENCH CANADIAN LADY.—Some of your cards are very good. The little child with bird is very pretty, and the expression admirable. The young lady with hat in hand is also very good. The chief tendency to defect is in excess of full front light, which has a tendency to flatten the faces. We shall have pleasure in giving our opinion on the heads when they arrive.

LANTERN.—The coloured gelatine sheets may be purchased of many fancy shops where fancy stationery is sold; also of confectioners. You will find aniline colours answer better.

A NEW SUBSCRIBER.—In our experience, no iron solution will yield good results as a developer if used over and over as it is in a dipping bath. We should try a fifteen-grain iron solution, with fifteen minims of acetic acid, constantly filling up the bath with fresh solution made as at first. 2. We have not heard of toughened glass being prepared for negatives; we doubt much whether it would be of service for negatives. Warnerke's film is the best substitute we know. Mica may be used, but is difficult to obtain of sufficiently large size.

REV. W. M.—It is often a difficult task to remove varnished negative films from the glass, as, especially if the collodion used have a porous structure, the varnish permeates the film, and partially cements the film to the glass. But we have seen cases in which the application of a moderately thick layer of gelatine has, when quite dry, pulled up the varnished film, and allowed it to leave the glass. The entire removal of the varnish is a difficult task. The only way is to soak or wash repeatedly with the solvent of the varnish. If, for instance, a spirit varnish have been used, then wash with alcohol. It is often the best plan to reproduce the negatives by contact printing.

ASBESTOS.—We cannot tell you with certainty where you can obtain asbestos; most likely of some chemist. Baryta white is sulphate of baryta. What is termed permanent white is, we believe, zinc white.

MR. BURY.—Thanks. We have not seen the "Opturateur" in question. We presume it is an aid to the use of supplementary diffused light as an accelerator.

A MAN.—There is no work published on the subject of collodion transfers. Many articles on the subject have been in the PHOTOGRAPHIC NEWS and the YEAR-BOOK OF PHOTOGRAPHY.

F. BROWN.—We regret that we do not remember the address of M. Jablichkoff.

C. R. P. VERNON.—The person you name is not, so far as we know, in business at all now, but has disappeared.

J. S. C.—We described the light in question, a few months ago, as the lime light without the use of oxygen, heated air being used instead. The ordinary illuminating gas is used, and the light is very brilliant. It would be somewhat inconvenient, we fear, for use underground. 2. The "opturateur" to which you refer is a means of using supplementary light as an accelerator. 3. Well-seasoned pine will answer well for wooden dishes. They may be treated inside with pitch, or thoroughly saturated with melted paraffin, or varnished with shellac varnish, or with a mixture of boiled oil and collodion. We should try the paraffin. Get the dish well made, with dovetailed or mortised joints, and the surfaces planed perfectly smooth. Then rub in the paraffin. If this did not answer satisfactorily, shellac varnish might then be added. If your dish has not been used for other chemicals, it may, after thorough washing, be used again for silver solution. If it have been used at all for hyposulphite solution, keep it for that purpose, and no other. Do not, on any account, use it for silver again.

J. T. ROBINSON.—Many thanks for your friendly letter and suggestion. If it is possible, we will act upon it. The explanation of the present mode is that the pressure of the moment when the task is executed does not give time for much arrangement.

J. C. STEPHENS.—We learn, on enquiry, that the papers have been sent. We shall give especial attention to see that no miscarriage occur. Thanks for YEAR-BOOK copy.

Several Correspondents in our next.

The Photographic News, December 21, 1877.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

THE SCIENCE OF PHOTO-ASTRONOMY—TRUTH, THE ONE ELEMENT OF PORTRAITURE.

The Science of Photo-astronomy.—Gradually a new science is making way among us, and one by one its conquests accumulate. We allude to astronomical photography. The camera, as we have shown from time to time in these columns, has often been made to record results and to write down the phases of a phenomenon as they are passed in review; but in connection with astronomy, it does something more than this. The astronomical camera is as much a scientific instrument as the microscope or telescope, and by its means we are gradually acquiring knowledge which, without the aid of a sensitive film, would have been altogether unattainable. We need not refer to Mr. Draper's well-known researches to prove our words; we need not point to Mr. Rutherford, of New York, and read his magnificent pictures of the moon; nor to the experiments of Professor Young, who claims to have photographed the protuberances of the sun in ordinary daylight. Indeed, the sun has of late years been almost exclusively studied by photo-astronomers, and the discoveries which have been made respecting that luminary, its photosphere, corona, sunspots, and other phenomena, are all the fruits of the camera. The last discovery of M. Janssen, of which we have spoken elsewhere in these columns, is due also to photo-astronomy, and would never have been brought to light unless photographic knowledge had been possessed by the investigator. A telescope directed at the sun's disk will tell the observer comparatively little. If he cut off the light sufficiently to permit him to examine the luminary with ease, then he has cut off too much to permit to find out the delicate detail upon the sun's surface, of which the camera has just told us the existence. All photographs have shown us hitherto, and what telescopic observers only have seen of the sun, is a disk of dazzling whiteness; but by a careful manipulation M. Janssen has been able to take a photograph betraying considerable detail on its surface. This he has done by constructing the period of exposure to something like one three-thousandth of a second, when he secures a latent image which, by careful development and judicious intensification, yields a picture of the sun such as never was witnessed before. Markings of various kinds are to be witnessed, of the existence of which astronomers had hitherto only dreamed, and these results are produced not once in a while by M. Janssen, but day after day. We are told that a series of intensifying operations have to be performed in order to make all the details visible, for if the plate receives a little too much exposure, all chance of securing the more delicate modifications is gone. Now that he has gone so far, the skilful French photo-astronomer will doubtless proceed to find out what more he can of those puzzling phenomena, sunspots, of which we, with all our science, know but very little at present. Indeed, a new era of solar science seems to have dawned upon us, and the prosecution of it is solely in the hands of photo-astronomers. Accounts come to us from India, that the amount and variation of solar radiation is being determined there, a research which is also conducted for the most part with a camera. In this country Professor Stuart and Mr. Lockyer are making preparation to continue similar experiments, the latter gentleman proposing to utilise Captain Abney's method of obtaining photographs of the red end of the spectrum, so that variations in thermal and chemical intensity may be recorded automatically. Seemingly, the camera is becoming an universal instrument of science among men engaged in optical and physical researches.

Truth, the One Element of Portraiture.—A photographic portrait may not be so much of a work of art as a painting or engraving, but still there is this to be said on behalf of

photographs: they are usually a good bit like you, while engravings, at any rate, never are. There are exceptions, of course, but look at the very well-executed engravings in our London illustrated papers, which contain the best work of this kind: if you are not familiar with the personage depicted, it does not much matter; you say he seems a handsome sort of man, or that he looks rather younger than you thought, and there the matter ends. But take the case of any one you really know intimately, whom you have met, perhaps, a score of times, and whose features are impressed on your memory. Has it ever happened that you have seen an engraving of such a person which has been in any way like him? Some engravings—many nowadays—are taken from photographs. The latter are not called art productions, the former are. And yet, as the art comes in, the likeness goes out, seemingly. There is a something about the eye or a twitch across the mouth left, that is in the original photograph, and this is all there is to tell you for whom the engraving is meant. In most instances it is purely the height of absurdity to call this or that the portrait of so-and-so. As we have said, when the spectator is wholly ignorant of the subject, he accepts what is before him without a murmur. It is only when he is acquainted with the being supposed to be represented that he becomes fully aware of the deception. And yet portraits such as these are all we have to read to our minds the features of the great men dead and gone. If the pictures in the best illustrated journals of the day present us with engravings, say, of Lord Mayor Owen and Sheriff Nottage, which we know to be altogether unlike the originals, it is not likely, we may argue, that the old prints of Shakespeare and Ben Jonson, of Oliver Cromwell and Queen Elizabeth, much resembled the originals either. People may say what they like about photographic art and photographic portraiture, but any one having placed before him two portraits, one a painting or engraving by even a great artist, and a photographic likeness also executed by a man of taste, would not hesitate for a moment as to which resembled the model in the greater degree. When placed side by side with a well-executed photograph, neither painting nor engraving, let it be ever so well executed, can hold its own. In fact, if art means something evolved from the worker's brain of which there is no symptom in the original model, it will be well indeed when we see no more of it in portraiture. If we care for a portrait at all, we want to have it like, and attempt to make the forehead more noble and to inspire more fire into the eye are simply efforts worse than useless. Already photography has done much to correct this romance in portraiture, and it will do much more yet. There is a wide field for painters and engravers without their attempting to improve on human nature. And for this reason it is that we hope steps will be taken ere long to form a national photographic gallery, wherein will be gathered together photographic portraits of great men in whose lives posterity will be interested. Let the portraits be skilfully taken and printed in permanent pigments, so that those who come after us may know something of the men and women they have heard and read about. Let us have painted portraits and engraved portraits by all means, so that the public may inspect them without let or hindrance. But we make bold to say that after an inspection of historical portrait paintings and ancient engravings, visitors would hereafter be only too delighted to repair to a gallery of photographs, there to learn what their ancestors really were like in the flesh and blood.

ON FOG-PRODUCING EMULSIONS, AND THEIR RECTIFICATION.

BY CAPTAIN W. DE W. ABNEY, R.N., F.R.S.*

DURING the discussion following my paper on "A Neglected Method of Intensification," on April 3rd last, which appeared in the Society's Journal, I incidentally mentioned

* Read before the Photographic Society of Great Britain.

my reasons for thinking that the effect of nitric acid in an emulsion, as a preventive of fog, was to prevent the formation of any chemically produced sub-bromide of silver, or to reduce it all to the state of bromide; and that this sub-bromide might be produced by the fact that a sub-bromide of the metal employed in forming the basis of the emulsion might exist, particularly if it was a diad metal, such as cadmium. I had intended to go further, and to say that any small quantity of the oxide of the metal, or of silver; or of the metal, or silver, might act similarly. The action of the nitric acid would be to form nitrates with the oxides or metals, as also with a part of the sub-bromide, leaving bromide behind. Where really pure bromide is present, it seems almost impossible that there should be fog. I had also intended to show, as a natural corollary, that the action of copper bromide (or copper chloride) on sub-bromide of silver, was to reduce it to bromide of silver, together with sub-bromide (or sub-chloride) of copper; and that this sub-bromide (or sub-chloride) of copper could only exist after all the silver nitrate had been connected. On the 3rd of August an article by one of the editors appeared in the *British Journal*, in which that same opinion was given. The article states:—"We shall now attempt to offer a rational explanation of the phenomena (the elimination of fog), and shall attempt to show that the action runs indiscriminately, whether a chloride, bromide, or iodide be employed, provided only the halogen be in combination with a metal which it has a less affinity for than silver."* This law will be found to hold good in every case, I believe, and the explanation is to be found in my paper I have already referred to.

The reaction there given is as follows:—

Silver + Copper Bromide = Silver Bromide + Copper Sub-bromide.
 $\text{Ag.} + \text{Cu.Br.}_2 = \text{Ag.Br.} + \text{Cu.Br.}$

We may now substitute for silver, silver sub-bromide, and the reaction would be:—

Silv Sub-brom. + Copper Brom. = Silv. Brom. + Copper Sub-brom.
 $\text{Ag}_2\text{Br.} + \text{Cu.Br.}_2 = 2\text{Ag.Br.} + \text{Cu.Br.}$

For the bromide we might substitute the chloride, and for the copper we might substitute cobalt, gold, &c., and the same results might be supposed to occur.

As already stated, the silver sub-bromide might arise from an imperfect soluble bromide, or through a mixture of oxide or the metal with it.

Instead of these haloid salts of copper, I have been accustomed to employ bromine or iodine, when evidently an equally effective reaction would take place.

I may mention that that indefatigable worker, Mr. Warnerke, first suggested to me the use of iodine, and since it is incapable of combining with alcohol, it is, perhaps, safer use than is bromine, which forms bromal.

Now what can cure—or, perhaps, I should say eliminate the chance of—fog in an emulsion should be equally effective with a dry plate made as with an emulsion; and in order to demonstrate this to you to-night, I have brought with me a series of transparencies all differently treated. I will, to avoid repetition, detail the way once for all in which every experiment, except one, was carried out. A 6×2 plate was coated with emulsion, dried, then carried out into the light. One end of the plate was treated with the fog-destroying agent, the whole then washed and dried. Next the plate was exposed behind a negative for a suitable time, and alkaline development resorted to, and the usual fixing, washing, and drying carried out. The first plate I hand round was treated with copper bromide (the bromide being formed by the double decomposition of copper sulphate and potassium iodide, as detailed in my paper already referred to). You will see that there is no fog on the part treated with it; the transparency is perfectly clear. The next plate shows the result of the substitution of ferric chloride for copper bromide; the fog induced by diffused light is nearly entirely destroyed, though the plate is not quite so bright

* It would have been more generally clear had the word *metallic* been placed before *silver*.

as the first. Bécham found that gun-cotton was converted into ordinary cotton when treated with ferrous chloride, and this, perhaps, may be the reason of the slight veil which is apparent.

The next plate is very instructive; the end was treated with potassium bromide, not for a short time, but for considerable time. You see that the fog is scarcely at all destroyed, and remembering that potassium is a monad element, we get a proof of what I have asserted regarding the necessity of the haloid being that of a diad.

The next plate is also interesting. You will notice that it is clear throughout, though if the experiment had been perfectly successful, it should have been bright, with fog at one end. The reason of this failure is that the fog-destroyer used was bromine water, and the vapour of bromine escaping from the solution has been sufficient to undo the work of the diffused light. This experiment is similar to one made by Mr. G. Shaw with the Daguerreotype plate, where he showed that the Daguerrean image would be destroyed by the vapour of bromine.

The next plate was treated with a solution of iodine in alcohol. You see how effectually the destruction of fog has been accomplished on the end to which the iodine was applied.

The sixth plate I show was treated with dilute nitric acid. You will notice how perfectly bright it is where the acid had access to the film, and I would here draw your attention to the marked difference in the behaviour of this film from that which would be observed with an iodide or bromide iodide film.

With the two latter it is almost impossible to destroy the action of light. You may develop a plate by the ordinary developer, dissolve off the deposit with nitric acid, develop again (adding silver nitrate, of course), and you get almost equally strong image. This may be repeated many times, as I showed some years ago in a letter which appeared in the *Photographic News*. It seems to me that this may have something to do with the necessity of using a very acid bath with bromized collodion, if great freedom from fog be desired.

The seventh plate I show is one treated with dilute sulphuric acid. The end so treated varies in the freedom from fog; the clearest parts are those on which the acid was poured, and on which the acid was allowed to remain the longest.

The last plate is one not exposed to diffused light, but simply a fog-giving emulsion, one end of which was treated with copper bromide before exposure behind a negative; you see that part is comparatively bright.

I cannot help thinking that all these plates are very instructive; the action that has evidently taken place—viz., the reduction of the sub-bromide to the state of bromide, is most marked, and in this respect tends to prove the correctness of the chemical theory of the developable (let us rid ourselves of that misnomer, the latent) image.

The results are before you, and you can draw your own deductions from them: to me they speak volumes.

As far as theory and practice go, I can see no reason why fog should ever be met with in pure emulsions—and when I say pure, I mean emulsions in which there is no extraneous organic compound added. When such bodies as albumen and gelatine are added, we may expect other results, as they we arrive at different conditions, if the emulsions have been prepared with an excess of silver nitrate.

I have now to retract an opinion which I have previously expressed—I mean the opinion I held regarding the comparative fineness of division of the particles in an emulsion. I stated that the ruby-coloured emulsion was coarser than the blue tinted. Had I given it a proper amount of thought I should at once have seen that I was in error. The particles in the ruby-coloured emulsion were small enough to allow the larger wave-lengths (the red) to pass through them, whilst they were large enough to stop the smaller wave-lengths (the blue). With the emulsion, which has

greenish tint by transmitted light, the particles are large enough to stop some of the red, and widely enough distributed to allow the blue to pass mixed with a portion of the red which, having been partly absorbed, pass through with diminished amplitude, and consequently with less intensity. The resulting general tint is, therefore, that of the shorter waves.

Mr. Berkeley's published experiments, in which he shows that when the greenish emulsion settles, the top layer has a ruby tint, is very instructive. I have repeated them with the albumen emulsion, and have no hesitation in saying that he is correct in his views. The ruby-coloured emulsion is all pure silver bromide; the heavier particles which sink first are a combination of silver bromide and silver albuminate. Too much stress must not be laid on the difference between a bluish and a red film, when we simply regard them in the light of a sensitive salt separated into coarse and fine-grained particles.

In both films the particles must be in an extreme state of division, otherwise there would not be the distinctive colour; in fact, the size of the ultimate particles must be measurable on the same scale as the waves of light themselves. I cannot say more at present on the other effects that may depend on the colour of the film, as my investigations in this respect are incomplete.

There is no doubt in my mind that the albumen emulsion has a greenish tint, which I described to the Society in June last, is more rapid than any I have tried. I offer a suggestion, which is that the organic salt of silver in the emulsion is the cause of the rapidity. The silver in combination rapidly takes up the bromine which may be liberated by the action of light on the bromide, and we have a film almost in the state of a wet plate, the organic salt of silver being substituted for the silver nitrate.

THE CHEMISTRY OF CARBON PHOTOGRAPHY.

BY ADOLF BRAUN, OF DORNACH.*

It is well known that the employment of chromium compounds in photography is based upon the fact that they possess the capacity when combined with albumenised substances, to permit the latter to be influenced by light in respect to solubility in water. For instance, if a coloured sheet of gelatine that has previously been treated with a chromium salt is put under a negative, it loses its capacity to dissolve in water wherever light has struck it: the more vigorous the action of the light, the greater the degree of insolubility. After a judicious exposure to light, you obtain, indeed, a picture composed of insoluble gelatine and pigment. As the greater part of the pigmented mass consists of lamp black (or carbon), so we usually call this method of producing photographs by the name of carbon printing.

It was Swan who was the first to show that the process in question was due to a reducing action; the chromic acid loses its oxygen, finally going over to a chrome-oxide, which forms with gelatine a horny mass. What sort of action goes on during the formation of this mass we are at present ignorant of.

We are of opinion that first of all chromate of potash is formed. If, for instance, a gelatine sheet treated with bichromate of potash is subjected to the action of light, it soon becomes of a bronze-brown, but upon the addition of ammonia assumes a greenish colour. This colour comes from the chromic oxide that is set free, that base combining with chromic acid, and forming chromate of ammonia. If the gelatine sheet is exposed still longer to the action of light, it becomes as green and brittle as glass. The same result may be observed with tungstate of soda, and in this case also a reduction of the tungstic acid appears to take place. Whether combinations of this acid may be made use of in carbon printing is another matter; but at any rate

it would be well worth while making a few experiments in this direction.

The more acid the chromic acid compounds and the more easily decomposed, the more rapid will the process of becoming insoluble proceed. With solutions of pure chromic acid, one can scarcely work. A tissue prepared with a three per cent. solution becomes rapidly insoluble even in the dark, but shows, on being put into water, always an impression of the cliché, a proof that some action of light has taken place.

A tissue prepared with a 1½ per cent. solution yields under a vigorous negative in the sun, within 45 seconds; an image, in this case, however, carmine and Prussian blue in the tissue, when the latter is of a purple or violet character, are thereby destroyed. Tissue sensitised with simple or yellow chromate of potash will keep good even in summer for several weeks, but is then hardly more sensitive than silver paper. It seems, therefore, that the best compound to use would be, under most circumstances, a mixture consisting half of the mono- and half of the bi-chromate. The formula for vigorous negatives should be the following—

Mono-chromate of potash. . .	2½ parts.
Bi-chromate of potash . . .	2½ "
Water... ..	75 "
Alcohol	20 "
	100 "

It is necessary that the salts should first of all be dissolved in water before the alcohol is added. The alcohol permits the tissue to dry more speedily, and lends it greater toughness, so that it is less liable to crack or break. According to Husnik, the ammonia salts of chromium distinguish themselves from all others by the remarkable quality that in simple combination they are just as sensitive as in the double combination.

In all cases chemically pure—or, in other words, recrystallised—salts, should be employed, as is invariably the case at Dornach. The chromate salts purchased in commerce generally nearly all of them contain some free chromic acid and chrome-alum, which may have a very injurious effect upon the whole process, from the circumstance that by a slight elevation of the temperature the solubility of the gelatine is thereby more or less diminished.

By the use of a solution of chloride of lime, or other oxidising substance, tissue which has become insoluble may be rendered soluble again. On this point I am now prosecuting experiments. Kruger maintains that chloride of lime strewn over the floor of the laboratory does much to preserve the sensitised tissue in good condition.

These remarks may not be of very great importance, but they will show the photographer who occupies himself with carbon printing that the knowledge of a little chemistry is of value to overcome the obstacles he has to combat.

SUN SPOTS STUDIED BY SOLAR PHOTOGRAPHY.

M. JANSSEN has obtained magnificent photographs of the sun, measuring some twelve inches in diameter, on which the granular solar surface can be as clearly distinguished as by regarding the sun through the largest instruments. He obtains these by diminishing the time of exposure to less than ⅓ of a second, and employing special means for the development of the image.

On April 14th last, M. Janssen states that a photograph of the sun showed no spots, and it was, therefore, reasonable to presume that none existed, as spots as small as one second in diameter were always registered.

On the next day, at about eight a.m., another photograph showed, near the centre of the sun, a considerable group of spots, the largest of which measured some twenty seconds in diameter.

M. Janssen points out that, as the earth when seen from the sun is but eighteen seconds in apparent diameter, our

* Photographische Wochenblatt.

globe could easily have been contained within the area of the largest spot. The suddenness of the apparition, and the grandeur of the phenomenon, led the observer to predict the prompt disappearance of the spots and frequent changes in their configuration. He further concluded that the idea that, when the sun (as at present) exhibits few spots, it is undergoing a period of repose, is inexact, but that the truth is rather the reverse, as spots then form and vanish with a rapidity much greater than at any other epoch.

Of course, these views of M. Janssen have led to many observations and much discussion by and among astronomers.

M. Derza cites a small spot which appeared on March 6th and disappeared before the 12th. The same observer notes the fact that the spot of April 15th formed on the afternoon of the 14th. M. Ventosa, at Madrid, also saw the spots form at five p.m. on the 14th, and mentions seeing other smaller spots appear and vanish rapidly during previous months.

M. Gazan dissents from M. Janssen's views, and regards sun spots as the result of eruptions in the solar mass. Before the spot, however, there are faculae which should have been seen. In the photograph of April 14th, however, faculae are altogether absent; but this M. Gazan explains by assuming that the faculae were too near the centre to be visible. According to him the spot in question will not disappear any more rapidly than spots during the maximum epochs, and he thinks that it will return.

M. Janssen, however, replies that fifteen days afterward, when the sun had more than completed his semi-rotation, the spot should, according to M. Gazan, have reappeared, whereas it did not.

M. Tacchini does not coincide with M. Janssen in the idea of the present activity of the sun; but, on the contrary, considers that an actual period of repose exists. He points out that there were 290 spots observed within five months in 1871, while but 24 were noted in the same period in 1876.

M. Janssen states that the first-mentioned total is exaggerated, for several spots which appeared three or four times were counted as frequently, and that numerous small spots could not appear and disappear rapidly, as is the case now, without producing excessively violent movements in the solar mass. This very great activity would militate against the formation of spots, and be favourable to the disappearance of those already produced.—*Scientific American*.

THE STATE OF BUSINESS.*

MR. E. T. WHITNEY next gives evidence, writing from "Norwalk, Connecticut." Trade has been gloomy, but prospects are improving. He then proceeds:—

To your second query, regarding styles most in demand, I will say unhesitatingly that with me the cabinet vignette is the most called for. I have consulted leading artists in New York, and they concur in the same opinion; but there is a growing demand for promenade and composition pictures. That there is not a greater sale for the latter styles may be owing to laxness on the part of photographers. Regarding prices, my prices within two years have been reduced to \$10 for cabinet and \$4 for carte-de-visite, formerly \$12 and \$5 per dozen. My experience is, that good prices insure not only first-class people (in plain words, rich people), but a class of customers of both sexes who spend money freely, and will have only the best. I find a decided improvement in the taste of the public, and they appreciate good work. It is a source of regret to me, and must be to many others who love the art, and aim high to attain perfection, to find leading men in New York so weak-kneed as to reduce prices one-half—men who have been prominent in our conventions have brought a lasting injury to the business.

You ask what sort of light I use? In answering this some may say, "Well, he must be old fogeyish, to use light invented thirty years ago;" and yet it is true, and, what is stranger still,

this is the standard light of the present day; know or have ever heard of the inventor, the late, I suppose, one of New York's oldest and best Daguerotypes. Starting two feet from the subject, perpendicular, then sloping at an angle of twelve degrees, twelve feet, width twelve feet. With the use of ten or twelve can be taken in fifteen seconds pictures of children, I place them within two feet of the window, and get them in a flash. In making the I shut off all top-light, place the subject opposite the side-light, and by careful adjustment of angles good effects in about fifteen seconds; working free by having two backgrounds, plenty of depth at operating room (which is forty feet long), the camera rolled to either side according to the drawing should the subject have a crooked nose, of course; the crooked side toward the side-light, leaving the shadow. There has been much discussion, and ideas advanced through the journals, regarding skylights, and one great reason why it has not thoroughly used is owing to the difficulty of getting proper shade. About twenty-one years ago I, with weak eyes, owing to use of cyanide of potassium, me that blue glass would relieve my eyes as well as and if it would not retard the operation, it would adopt it in building my new light at Norwalk. I O. Harrison, the well-known instrument maker, that it would accelerate the production of photographs. The glass could not be obtained in New York, and Downing sent to England for it; when it arrived beautiful shade of light blue, ground on the inside; used for twenty years, and would recommend it. The first blue light ever used for photography, but the to C. C. Harrison.

The time cannot be far distant when an institution where photographers can perfect themselves in every art will be established in some large city; and there are many experienced operators who, tired of the vicissitudes of business, would gladly exchange, teachers for the Photographers' College. Mr. G. article, "Shall Prices Come Down?" is very good; his prices for half dozens these hard times would drive away. My policy has been to secure the sitting, please the customers, they are pretty sure to order. The price, \$4 for 4-4, is out of proportion; compare of work getting up one 4-4 to making twelve good cards. I make cabinet, first at \$2, half at \$5; 4 carte-de-visite, \$4 per dozen; half-dozen \$2.50. I am moderate and fair considering the times, as customer without a groan. "A bird in the hand,"

In answer to the question, "Do burnishers cause scratches?" I feel like saying "Yes," but it is only a

Mr. H. L. Bingham, writing from Texas, says: "Way out here on the frontier it might be thought would be little taste manifested for the photograph, assure you it is quite the contrary. The panic depressed business enterprises of every class throughout the country has been but little felt here. This is attributable to the products of this frontier count wool, and cotton, being the chief, and ready market good prices, and the cattle market has been remarkable this season, consequently the prospects are that all trade will be good this coming fall and winter."

The present style seems to be the vignette in general must say, is beautiful when properly handled. Cards are the prevalent sizes, and a large proportion of cabinet. I seldom make less than one dozen from which I get \$12 for, and \$5 per half-dozen; cards \$3 and \$3 per half-dozen. I find people will pay good prices for carefully finished work, and at present I have adopted of doing my work myself, and thus use the proper care in getting it well done, and I am satisfied this, with me, is more than trusting to such help as I am able to hire.

I find a decided improvement in the taste of my patrons frequently the remark: "If you can do better by giving time and pains to the work, do so, and I will willingly pay for it."

In my experience of twenty-five years and over in graphic art, the class of people who form the greatest patronage are willing to pay good prices for good

* Continued from page 592.

I must say I believe photographers who are continually dropping on prices in an effort to secure trade or an increase of trade, make a great mistake; they not only lower themselves in the estimation of the people, to that class who are such poor workmen that the inducement they offer of cheap work is the only recommendation they have, but they fail in this, that they do not increase the receipts so much as the poor work. The time has passed for the better classes to be thus induced to patronize inferior workmen. The inducement of cheap work is not sufficient to secure a class of patronage that are sufficiently cultured to desire anything excellent, and I do not believe it is policy for one who has any respect for the art to reduce prices to such an extent as to cause slighting their work, which it does. Good prices give tone and character, and this is what refined tastes admire. I make but few photographs with fancy backgrounds, as such are only adapted to full-figure pictures, which I do not consider advisable for card or cabinet, as it makes the face too small to give a faithful likeness, and enable the proper display of light and shadow. In 11 by 14, or larger, full figures will answer very well. While the bust, or head and shoulder photographs have become somewhat hackneyed, yet in a majority of cases I much prefer them to full figures. The hand is sometimes a very beautiful and expressive organ, but sometimes a great source of annoyance, and often spoils what would otherwise have been a very fine picture.

Light is a subject which has been pretty thoroughly discussed, and one which seems to me of much importance; but I have found in my practice that not so much depends on the peculiar form and size of the light, as in the mode of handling the light. I use an ordinary side and skylight: the size of skylight is 10 by 15; sidelight running from within two feet of the floor to the skylight, where the two sashes meet.

I have been in Texas four years, and when I went North in April I expected to find myself far behind in many things. I, however, found my work much like that I saw in the cities I visited. I was in Baltimore, Washington, Pittsburg, Cleveland, Chicago, St. Louis, and other cities. This was quite a surprise to me, as I believed I had been in this far Southwest country so long I might have lost some of my spirit, and retrograded instead of progressed. I, however, do not think there has been much progress within three or four years. Photography seems to be resting awhile on its already won laurels.

Mrs. Lockwood writes from Wisconsin:—

We are not dead, neither do we sleep, but are busy in our efforts to convince people photographs must be had, if "times are hard;" and we have partially succeeded, for business has been very fair, and promises to be better this fall than for several years past. We are having quite a demand for large portraits, mostly in India ink, which command prices from \$15 to \$50 each. We still retain our prices of \$3 to \$4 per dozen for cards, the size of head determining the price. Cabinets and promenade, \$4 and \$4.50 per half dozen, or \$6 per dozen. 4-4's, we charge \$4 for first copy and \$1 for duplicate, or make three for \$5, which is the usual case, and gives us a still better chance to sell frames.

Our prices are higher than any other artist charges in this place or adjoining towns; but we will charge enough to do justice to our work, and make enough to keep as well-furnished and equipped a gallery as can be found in the West; and by taking extra care to give the best position to bring out every good point of feature and character in all faces, and modify the bad points, we succeed in giving good satisfaction, and drawing customers from far and near. Every day we have more or less calls from strangers, and people just spending a day or so in this place, who "have heard of the gallery, and could not leave town without calling"; and they seem to be charmed with everything about the rooms, and speak of its being so different from any other gallery. We have proved that it pays to keep a nice gallery, and furnish it in such a way as shall impress the public that they are in an art gallery, and the proprietors understand their business and keep up with all the improvements in our art. I know that people are willing to pay more for work when their surroundings are pleasant enough to reflect some animation in the shadow of their face, than to sit for a picture where the ladies will gather up their dresses to keep out of the dirt and filth on the floor, and feel like dusting the chairs before they can sit down. I believe it is impossible for a person to have a happy expression in such a place while sitting for a portrait. A dirty gallery and low prices go hand in hand. If you can't do good work enough to command a good price, which will pay

to keep things in good taste and order, do let the business alone is my advice to every one. We find that our patrons, far and near, are becoming educated to know what constitutes a nicely finished picture, and the demand is increasing for composition pictures, though the most we have to work for seem to prefer a fair-sized head, either printed full or shaded vignette, in preference to fancy backgrounds and full-length figures.

We use a very steep north skylight and sidelight, and are never troubled with sunshine, but have a very uniform light, and working quickly.

I believe the time has come when good work can command good prices, and success alone depends on these two things, combined with order, cleanliness, and taste in the arrangement of galleries.

Mr. H. Rocher, an artist who does very high class work in Chicago, says:—

I think the prospects are rather encouraging for the coming fall. The styles of pictures mostly sought for at present are cabinet and promenade, full and three-quarter figure, less busts, and very few cartes-de-visite. The imperial, as I have introduced it at the Centennial, seems to become quite a favourite picture; it takes sometimes the place for an order of a larger picture, whereas this dozen (\$80) is no more than would be charged for one large portrait. In regard to the taste of the public, I will say that one and two years ago I encountered often difficulties upon showing the public what we call our composition pictures. Many at that time were too much accustomed to the old stereotyped photographic pose; but now it can be plainly observed that not one out of a hundred want this old-fashioned pose, but gladly accept what I think proper to make for them. There is no more objection made to a given pose, particularly in the full-figure picture, and I may fairly call this a great step forward and onward in the way of improving public taste. It is evident that in the way I work, more care is taken in the composition, and, consequently, more time is spent than is done with ordinary poses, and it further follows that I charge for my work accordingly.

The prices at present are for cabinet, \$12; promenade, \$15; boudoir, \$22; imperial, \$80 a dozen. Single pictures from 4-4 upwards: 4-4, \$6; 8-10, \$10; 11-14, \$15; 14-11, \$20; 17-20, \$30. It is at least cheering to say that no objection is made to my prices, which, in fact, I have never found the necessity to lower, and never will. I do not believe cheap prices help the reputation and business of a photographer of any pretension. Nor do I believe in working for nothing.

My light is a pure north sky and sidelight, plain glass, and blue curtains. It pleases me very much, and having full control over it by my means of my system of blinds, I can produce any conceivable effect under the same.

Mr C. J. Stiff, writing from Minnesota, says:—

I predict that business this fall will be brisk, for the reason of there being an abundance of wheat and other grain now going through the process of harvesting. In 1872, when I first came to this city, there were no cabinet photographs made to speak of; now with me fully one-third of my orders are for the cabinet size.

My prices for cards—\$3.50 plain per dozen; \$4 for vignettes cabinets, \$6 per dozen, either plain or vignettes. Yes, I think the public understand better what constitutes good work now than they did ten or fifteen years ago. My observation for the past seventeen years has been this, that the photographer doing the best work has the most custom, and does the best business. In regard to prices, I claim that photographers should do good work and get good prices; not exorbitant prices, but such as will justify them in finishing their work up in first class style. I believe in one price, too, to all customers, but many photographers fall into the error of charging several prices for the same work, making the price to suit the customer. I think that locality and class of gallery should govern the price of pictures, good work considered.

My light is a top and side, plain glass, facing northwest; top light set at an angle of about 40° or 45°, about 10 feet to the lowest pitch. I think for full figures that a fancy background is more acceptable than a plain one; am sure my orders run that way; in fact, by looking them over, find the fancy grounds preferred.

The bust figure and a well-lighted head seem to be the choice of the public, and I glory in it, for what is there for a photograph that is nicer or more artistic than a beautifully lighted head?

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REMOVING FOG, AND RESTORING SENSITIVENESS OF EXPOSED PLATES.

We cannot read Captain Abney's paper which appears on another page without feeling that the results there detailed are likely to be of use to some dry plate workers, since it puts into their hands a method of dealing with an enemy who has hitherto made a most stubborn resistance to all attacks made upon him—we mean fog, either produced in an emulsion itself, or by the direct action of light. It is somewhat remarkable, as pointed out by Captain Abney, that it is the pure bromide of silver alone which can be treated as he suggests; and that with an ordinary bromo-iodide or pure iodide of silver the same means would not apply. Whether this be the case or not, however, is not of much practical importance, since we may presume that the cases where his method would be applied would be confined entirely to dry plates: and we are not cognizant of any dry plate process, in which the iodide or bromo-iodide of silver is the sensitive salt, that is not protected by some preservative. The removal of the preservative, and a fresh application of it after the destruction of fog, would be tedious; hence the method must be chiefly applicable to washed emulsion plates. We shall leave any theoretical considerations of the subject to the end of our remarks, and at once point out some circumstances in which the restorative process might be applied with advantage.

Correspondents frequently complain of the annoyances they undergo when travelling abroad from Custom House officers insisting on opening the boxes containing their stock of dry plates, and their consequent destruction. Indeed, we usually advise travellers to separate their dry plates, packing them in small bundles, by which means the curiosity of the Excise officers may be satisfied by simply opening one small packet of the plates. This comparatively small sacrifice may secure immunity for the others. The loss of some half-a-dozen plates, however, is annoying, particularly when the question of weight of baggage is a consideration, and anything which will avoid it will be a boon to all photographers. The experiments undertaken by Captain Abney may be fruitful of practical results in partially overcoming this annoyance. Suppose the photographer who may travel abroad takes with him plates prepared by the washed emulsion process, and that by some means or another they are exposed to light. In order to render the film once more utilizable, the plate may be simply immersed in nitric acid, or a wash of iodine water may be applied to it, and, after a rinse with plain water, and drying, it will be in an unfogged state. If for no other purpose, this will prove useful to the photographer, and the boon should be appreciated by many.

The theoretical deductions to be drawn from the experiments indicated are of the greatest interest. If any doubt existed in the minds of the thinking photographer as to whether the latent image was the result of a chemical or physical action in the sensitive salt, the experiments must in a great measure extinguish it; for it seems to us that the only way to account for the results in a straightforward and simple manner is to assent to the chemical theory, in which an absolute decomposition of the sensitive salt, and a formation of a simpler compound, takes place. Had the experiments been confined to the elimination of fog by merely one agent, some hesitancy in accepting it might have been felt; but when it is seen that the destruction of the fog-producing body is affected by various bodies, and that its restitution to a form which is again capable of receiving a latent image is effected by those very agents which meet the requirements of theory, then we are led to conclude that the theory is not built upon mere hypothesis.

The fact that nitric acid plays the same part as halogen-giving body is most confirmative, more particularly if we examine this experiment in connection with that in which sulphuric acid was the destructive agent. In the examples shown, nitric acid was the more effective of the two, but it was also evident that by a more prolonged action of sulphuric acid the same immunity from fog might have been obtained. Now, if the sub-bromide of silver be decomposed into bromide of silver, one atom of bromine being dissolved by the acids, we should expect the same results as those obtained by Captain Abney, since nitric acid acts much more freely than sulphuric acid on metallic silver, even when in a fine state of division.

THE DISTANCE OF THE SUN.

THE fruits of the Transit of Venus expeditions sent out by Government two years ago may now be said to have been gathered in, and the result, according to Sir G. Airy's theory and Captain Tupman's calculation, is that we may consider the sun's distance from the earth to be 93,321,000 miles. Captain Tupman believes that there is a possible error to the extent of 200,000 miles, but that if Sir G. Airy's theory on the subject is correct, no greater allowance than this need be made.

Bookmakers, however, must be careful how they make use of this data, for it is based upon what is known as the Delisle method, and this method more than one substantial astronomer—Mr. Richard A. Proctor among the rest—believe to be faulty to a degree. Mr. Proctor points out, indeed, that there is a discrepancy of one million of miles between the two sets of observations, namely, the ingress of the planet Venus and its egress, as shown in the photographs recording the Transit; and this great discrepancy is alone suspicious. In fact, if we take the mean of six other methods (besides Delisle's), and compare the result to that of Captain Tupman, there is a difference of one million of miles between them. It is evidently Mr. Proctor's opinion that 92,393,000 miles is nearer the truth than the result given out by the Greenwich Observatory, and since this is not the result of one teaching, but of six, certainly more reliance may be placed upon it.

It may seem to many that, after all, a difference which amounts to little over one per cent. can be of slight importance in such a matter, but this is hardly the question. The point is, what shall our text and instruction books take as their guide, and how are students and school-boys henceforth to be instructed?

A DISCUSSION ON DEVELOPMENT.

AN important discussion upon the development of negatives was entered upon the other day at the Berlin Society for the Advancement of Photography, and is worthy of remark, if only to show the opinion of some of the leading German

photographers upon a subject in which all of us take an interest. The matter was broached in the first place by Herr Richter, who wished to point out the action upon under-exposed plates of a solution of iron, salicylic acid, and silver. Herr Richter avowed that negatives which had been developed in the ordinary way, and found to be under-exposed, showed detail afterwards when flooded with a liquid of this kind. He made up his intensifier in the manner following:—

Ordinary iron developer	...	...	...	1 part
Weak silver solution	...	...	...	1 "
Saturated solution of salicylic acid in water	...	...	...	1 "

The salicylic acid is added last, in order to prevent the otherwise free precipitation of the silver.

Another method of treating under-exposed negatives was referred to by Dr. Vogel, who stated that he often found it necessary to pour a second dose of so called intensifying silver solution mixed with the developer upon a landscape plate. Large portions of the foreground which at first appeared under-exposed were in this way brought out in all their details. Another well-known photographer, Herr Primm, bore testimony to this method of treating under-exposed portions of a plate, the fog-like appearance produced by the precipitated silver exercising quite an advantageous effect upon the plate. An addition of some pyrogallol acid to the iron was also beneficial.

Another gentleman, Herr Halwass, was of opinion that more detail could be secured by washing the plate after the first development, and then treating it a second time with the solution. Also in development, he said, a much more delicate picture was obtainable if the plate was kept steady, and the liquid not allowed to flow backwards and forwards.

Herr Reichard, taking another direction altogether, made mention of a curious fact. He said that if a negative were gummed, but not varnished, and then worked over with a stump and a little graphite, the latter brought out more detail than was at first apparent on the cliché. The detail came out especially in the transparent portions, which seemed to attract the graphite more particularly. This last view received confirmation by no less an authority than Herr Hartmann, who avowed that in varnished negatives he had observed the same thing. If the transparent hair portions of a portrait were softly worked over with a broad-pointed soft pencil, further detail would frequently make itself apparent.

BEFORE THE CAMERA.

BY DR. M. VOGEL.*

THE desire for the image or counterpart of oneself dwells deeply in every breast, and is found, like hunger and thirst, in individuals of all nations, all ranks, and social classes. To this cause may be attributed the fact that the youngest of all modern arts—namely, photography—has become the most popular and widely spread. Even the corpulent, bearded Turk, despite Mahommed's behests, cannot conquer it: his harem-beauties encourage it; it upsets all customs. The pig-tailed John Chinaman, the brown Hindu, the swarthy son of Zanzibar, all bow before the camera in admiration; aye, even the chieftains "Red-cloud" and "Fire-eater," of the far-off Rocky Mountains, willingly sacrifice two beaver skins for a dozen cartes-de-visite, should an itinerant "pioneer photographer" chance to visit their wigwams. And how content these children of nature are, too, with their poorly-executed photographs! What few objections they raise in comparison to the spoilt citizens at home!

In our over-civilized world, each and every individual imagines himself an ideal picture, which self shows up in a glorious light and form, and as like to nature as the well-known landscapes entitled "Sketches from Arcadia."

Only seldom does realistic photography agree with the pictures of phantasy, and more or less tragical or comical

conflicts are the result of the discrepancy between the real and ideal.

How frequently do we hear it said, "I have been often photographed, but never came out twice alike!" And how easy it is to reply, "Photographs must always be alike!" Both opinions are, however, strictly speaking, wrong; although by competent judges the latter is considered and accepted as true.

I know a nice-fashioned girl of some seventeen years of age, with blue eyes and rosy cheeks—a picture of youthful beauty, sparkling with fun and life. This little lady cannot sit still a moment; her head tosses from side to side, her eyes sweep round under the long eye-lashes; she is as lively as a young sea-lion's cub taking its first dive in the water. Now, this lovely child never appears the same in a photograph, and the reason is not very difficult to find. In being photographed she must remain perfectly still; that flaxen head must not be tossed, those restless eyes must settle themselves quietly and fixedly on one spot. That is too much for my young lady: it is found compulsory and irksome; a strange expression spreads over her usually merry countenance, and this accidental expression is, unfortunately, depicted in the photograph.

In this case the original is clearly the cause of the failure of the portrait, and so it will nearly always be found to be the case. Often those about to be photographed chance to wear an unusual expression, which is faithfully perpetuated in the photograph. It is not uncommon for people suffering from headache or toothache to repair to the photographer, or, in some cases, after a bad night's rest, an exchange of words with their better half, or even after they have discovered that the stocks they sold at so-and-so have just gone up with a run. With a fierce expression they place themselves before the camera, and are horrified later on, when they find it represented in the picture.

In this case the photographer is in no way to blame for the failure of the likeness. The photographer can have no idea if the expression his sitters wear is a regular and natural, or an assumed one; he does his best both artistically and practically, but all his trouble and care are annulled by the expression worn by his sitter. It is another thing when the photographer is himself to blame, in causing this expression by some undue or unnecessary behaviour on his part. Long waiting, the great objection to the head-rest—which, though highly necessary for the production of a good, clear photograph, is greatly disliked and objected to—and the weather, are also often causes of bad likenesses; and also a little uneasiness caused by new clothes or boots, specially donned, perhaps, for the occasion. For the most willing person, however, it is no easy matter to maintain the same expression for some moments without moving a muscle of the face or the eyes.

In photographs taken in the months of November and December it will be noticed that these bad or false likenesses are very prevalent—the bad light being unfavourable to the action of the chemicals, and necessitating a lengthy exposure. Sometimes the necessary exposure will be six times as long as in summer; and during that time the countenance unconsciously changes its expression, and wears. The photographer exposes the plate to the smiling seraphim, and covers it before fallen angels.

Nothing is of more importance for the production of a good and perfect photograph than a regard for the choice of dress. Year after year the great Paris costume and mode magazines and factories send into the world dresses and costumes of new stuffs and designs for all classes—for the educated and uneducated, for those with taste and those without; and out of this mass, how few can choose anything that really suits them! A lady with a short neck will wear a fashionable stand-up collar, so that no trace of it is visible; another, with whom this part of the body is "swanlike" in its proportions, chooses a turtleneck collar in lieu of the saleable stand-up, disdaining even the simple velvet band as a means of hiding the elongated extension between head and

body; while a third—with small shoulders—makes them appear still smaller by wearing a light dress with tight-fitting, dark-coloured sleeves. She who ought to hide her scraggy arms and “beetle-crushing” feet, costumes herself in short sleeves and dresses; while others make their long faces appear still longer by choosing a head-dress of mountainous proportions. In a word, folly and extravagance reign triumphant, and the simple excuse is, “It is the fashion.”

In life, however, such want of taste is soon forgiven, and attention is not greatly attracted by it. In the portrait it is at once detected. Many people who have not the slightest idea of the mistakes they make in the choice of dress, perceive it at once in the finished portrait. Next to fashion, colour plays an important part. Stout people should always avoid light clothes, which make them appear stouter than in reality; but thin people also in white or light clothes are not always content with their picture. Photography produces the whites too white—that is, lighter than they naturally appear. A much shorter exposure is necessary in taking a fair face than a dark one. With the latter, however, if the photographer times the exposure for the face, he loses the fine details of the light dress, the white embroidery and lace, &c.; this difficulty is, however, met by concentrating and modifying the light that falls on the head and shoulders. Besides the mass of white in the picture, the head appears dark and insignificant. Nothing is more intolerable than the effect produced by light trousers and waistcoat in contrast with a black coat, in which gentlemen present themselves in the summer.

Many people will be taken only in a certain position. They throw themselves on the sofa, stretch out their legs in the front of the camera, totally ignorant that in this position they will appear with the head of a dwarf and legs of elephantine proportions. There are many other positions which to them are “charming,” but on account of perspective failures in the optical picture are wholly unsuited to photography. In these circumstances, the public should submit entirely to the photographer; he must know best which position is suitable or not; and remember, at the same time, he is artist as well as operator. Even suitable positions will not be adopted by some. Many a young lady will insist on being taken in profile à la Maud Branscombe, without the slightest idea that the principal feature, the fine profile, is wanting.

A great difficulty to contend with is the taking of children. In the strange locality of the studio, among strange people and things, they at once assume an astonished and bewildered expression. Many a clever child appears when photographed an idiot. There is an old saying, Every crow thinks her young one fair, Every mother sees her child as a “little angel,” and it is no wonder that she is so desirous of having the little one photographed. Instead, however, of lovely cherubs like Raphael productions, with their curly heads, soft angelic eyes, round cheeks, rosy lips, and lovely shoulders, breast, and arms, such as you will not find among a thousand children in nature, we perceive the lank-haired, broad-headed, almond-eyed babies, with pinched cheeks, drawn-mouths, and weak and thin arms and breast. People should never choose positions from celebrated masters or sculptors.

Very often the photographer places his sitters in a position to them stiff and uncomfortable, which, however, when seen in an artistic view through the camera is far from stiff, and, moreover, is graceful. Ladies especially, directly they have given a sitting, at once begin to re-arrange their dress, ruining at once any artistic folds, &c., which had been luckily obtained, and which add so much finish to a picture. A modification of the position of the hand, a slight alteration of the same, and a scarcely perceptible arrangement, will often produce from an inelegant figure a really handsome outline. In no other art is success so dependent on momentary contingencies as in photography; on this account it is necessary there should be presence of mind on the part of the photographer, and willingness on the part of the sitter.

SHORTENING OF EXPOSURES.

BY DR. LIMBURG.

The latest discovery about the shortening of exposures is an after-exposure of the plate with violet light. We are already acquainted with prior and subsequent exposures through opal glass and by means of blue and red light; that touching violet light appears to have recently been patented in England by Signor Scottellari, who some weeks ago gave demonstrations of his process both at Düsseldorf and Berlin.

The simple apparatus by means of which the auxiliary exposure is brought about consists of an ordinary lens cap, in which a round hole about the size of a half-crown has been cut; this hole is covered with some tissue paper impregnated with violet aniline colour; beyond the opening is a metal disk of the size of the lens cap made fast by means of a screw around which it turns, so that by means of this disk the violet paper may be covered or laid bare. The apparatus is employed in the manner following. As soon as the lens has been focused, the cap is put upon the lens and covered with the disk, so that no light can fall upon the lens; the dark slide is put into the camera, the slide is lifted, and the plate exposed by removal of the cap complete. The exposure is shorter than usual. The cap is then put on again, and the metal disk turned round so that the light can fall upon the plate. After a time the violet paper is covered by the disk, the dark-slide is closed, and the plate developed in the usual manner.

Mr. Taylor, in company with Mr. Foxlee, has already worked in a perfectly similar manner, and found that the time of exposure is in this way materially shortened, whatever colour the paper may be, and that white light is as good for the purpose as any other.

Another kind of after-exposure I employed six years ago; this was by removing the stop from the lens, so that the end of the exposure is conducted with an open lens without any stop at all. In this case the proportion between the opening of the diaphragm and the opening of the lens must be taken into consideration. Herr Gustav Wahl, of Mainz, who has lately recommended the same process, advises in the *Photographischer Correspondenz*, instead of a prior exposure of 15 seconds, one of only 7, through the stopped lens, and an after exposure of 2 seconds with the open lens. These figures differ according to circumstances; where an exposure under ordinary circumstances would be 42 seconds, the time for prior and subsequent exposure would be 18 and 6 respectively; in the case of 72 seconds it would be 28 and 7; in the case of 144 it would be 50 and 10; and in the event of an exposure of an hour the two intervals would be 32 minutes and 2 minutes.

No unsharpness should be the result of this after-exposure, and it is necessary first of all to make an experiment, in order to settle the time of prior and subsequent exposure.

This matter I have still further simplified by the introduction of a coloured diaphragm. In the place of the ordinary diaphragms of metal, I cut them out of sheets of coloured gelatine. As a rule, I take a red and violet sheet, and place them one over the other. The rays which go through the lens opening act upon the plate in the ordinary way, while other rays penetrating the coloured sheets of gelatine add intensity to the image. By these means the same thing pretty well is accomplished, the portrait assuming a more tint appearance more or less.

The post, prior, or contemporary exposure of the plate through the free lens or the coloured gelatine sheet, works in quite a different manner to the process alluded to at the beginning of this article, where a coloured paper diaphragm is employed, or opal glass and such like; it also materially differs from any kind of prior or post exposure without employment of the camera. For in the first case the sharp image is strengthened by an unsharp image, while in the other instances the action of the light is just as much in

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deepest shadows as elsewhere, the result being, in fact, a slight fogging, which does not, however, act in a prejudicial manner, from the fact that slightly fogged negatives often print with much more beautiful results than a clear cliché; indeed, many photographers employ a matt varnish or thin tissue paper to cover their negatives, in order to produce a fogging artificially.

All the kinds of supplementary exposures have their advantages, and it is very easy to combine them, employing at the same time one method and the other, a cap with opal glass or coloured diaphragm, being used with the principle of withdrawing the diaphragm. The coloured diaphragms are produced by cutting up a sheet of coloured gelatine (which is to be purchased of all tints), into the shape of a diaphragm, and punching out a hole of the proper size.

Those who desire to make experiments with coloured gelatine diaphragms should not forget that the focus is easily altered if particular care is not taken; the object should be focussed through the gelatine, otherwise the image will be unsharp.

The working with the camera lined inside with white, red, or blue is also another way of availing oneself of supplementary exposure by means of reflected light.

Correspondence.

DURABLE SENSITIVE PAPER.

DEAR SIR,—I can fully confirm the great advantages in the use of durable sensitive paper as set forth by your correspondent "Argent Nit." The convenience of having paper always ready for the printing frame, and no anxiety as to whether it may be spoiled if not printed by a certain time, and to be able to keep two or three days' or more printing to tone at the same time, can only be fully appreciated by those who have adopted its use. I should be sorry indeed to have to revert to the plan of sensitizing the paper as wanted; but I think your correspondent wants to have all the advantages he mentions, without being willing to pay a reasonable price for them.

I claim to be better able to judge as to the cost of preparing a durable paper than he is, for this reason: that he evidently is not in the secret of preparing such a paper, and I am. I prepare my own paper, which will keep for months, prints quickly, gives beautiful tones, and I obtain upon it better prints than I used to do when I sensitized in the ordinary way.

First, your correspondent takes the silver at its present low price, which it is very uncertain how long it may continue; then he only allows one ounce to a quire (this makes too weak a bath for a good durable paper); I use about twenty-six ounces to a ream. Then there is gas and the chemicals used, besides the silver. The cost of these "Argent Nit." cannot estimate, as he does not know what they are. Threepence per quire will not, however, cover it. Then, he says, a quire an hour could be done; or, by a good hand, a ream a day. Does he expect anyone to work twenty hours per day? And then, after all, he only allows one shilling and sixpence per quire to cover labour, expenses of packing, and the profit which a dealer is fairly entitled to. The fact that there are several sensitized papers in the market at slightly varying prices is a proof, that those prices are reasonable, otherwise competition would have brought them down.

If I knew the address of "Argent Nit." I would send him a sample of the paper I prepare. I have sold it to a few photographers who know of it, but the profit is so moderate that I do not care to go to the expense of pushing it in the market, as it would interfere too much with my ordinary business as a photographer. — Yours truly,

M.

DEAR SIR,—I see in last week's News a letter from one who writes under a *nom de plume*, "Argent Nit." respecting the price of sensitized paper, and in reply to his, I beg to offer the few following remarks. It is not true that sensitized paper is high in price; it is a great mistake that it is so low. Good sensitized paper is really worth 20s. per quire and 1s. per sheet, and I think that it would pay all photographers much better to pay that price than do it themselves every day, as "Argent Nit." talks of his printer doing. I am very much afraid that he is quite wrong in saying that its cost is only 9s. 6d. per quire. I think that if he tried it he would find it cost at least 12s. 9d. or 13s. per quire; at least, that is our experience, which extends over many years. If you reckon albumenized paper, which ranges from £5 to £6, then there is silver nitrate; to get good, it is from 3s. 5d. to 3s. 6d. per oz. I know there are some cheaper, but can you depend on it? Some dealers say it is not pure at 3s. 8d. I think that "Argent Nit." will find the following figures somewhere near the mark:—

	s.	d.
Albumenized paper per quire ...	5	6
Silver nitrate, one and half oz. at 3s. 6d.	5	8
Acid ...	0	3
Roller 1d., wrapping paper and gum 1d.	0	2
Rent, fire, and gas ...	0	3
Wages per quire ...	0	6
Postage ...	0	6
Management, booking, &c. ...	0	8
Total ...	12	8

To say nothing of breakage, trays, bath, bottles, &c., I do not think it possible to prepare a quire of paper with less than one ounce and a half of silver, nor to be able to do a quire in less than two hours. As that only leaves three minutes for paper on bath, one minute for laying it down and one minute for taking it up, is it possible to do a quire in an hour, or a ream a day? I think that if "Argent Nit." had to do a quire per hour or a ream per day, say on a fine July day, he would fancy he was as badly off as the Claimant. If "Argent Nit." had to do twenty quires per day, when would he get his refreshment, sleep, and pleasure? He should remember the old saying, "All work, and no play, makes poor Jack a dull boy."

I dare say that "Argent Nit." is like many others, and thinks that prepared sensitized paper is a new affair of some seven or eight years old. This is a great mistake, for it has been prepared by the writer's late father seventeen or eighteen years at least (but of course not so perfect as it is now), and it was tried by the late Mr. Fowler (firm, Harvey Reynolds, and Fowler, Leeds), to introduce it to the photographer. Its only defect was want of albumen; as to its keeping qualities, they were first-class. I have by me some that was prepared sixteen years ago (of course it is printed, toned, and fixed), and the prints look to-day as good as the day they were done. Therefore I think I may make a claim for one who has passed away from us as the first one that ever did any prepared sensitized albumenized paper; also that during his time he invented a machine for sensitizing paper, which has been working for the last four or five years. This I dare say is the first thing of its kind, and perhaps the only one. This makes the paper, every sheet and every quire like the others—like Horniman's pure tea, "always good alike."

Hoping that I have not occupied too much of your space, — I remain, yours, &c.,

J. T. CLARKE.

Bridge Road, Stockton-on-Tees, Dec. 18.

A TRUSTWORTHY TEST OF IDENTITY.

Sir,—Will you, on public grounds, permit me to invite the attention of the authorities of police and prisons, and

also of photographic artists, to a matter now first noted, and which is set forth in the annexed statement?

DUPLICATE "NEGATIVES," AS A TEST OF IDENTITY.—In photographic portraiture the expedient is occasionally resorted to of coupling together two negatives, for the more effective production of a given portrait. Doubtless, the most inveterate block-head will comprehend that in such cases the two negatives are, of necessity, those of the self same person. Indeed, it has been hitherto taken for granted that the duplicates must be not only those of the same sitter but also those of the same sitting.

The invention of the *Identiscope* (an appliance by which life-size photographs are subjected to analysis on a purely mathematical basis) has now shown that by the "geometric method," any suitably enlarged photographs, affording full-face likenesses of one and the same individual, can be also coupled, even after many years of interval, and with the same mathematical precision as those which have been taken simultaneously. There ensues in such portraits a medallion-like effect, which is the direct consequence of the minute correspondence of the two independent negatives. And thus, in cases of doubt, this fact becomes an immediate and infallible test of personal identity.

And this is precisely the point arrived at in the instance of the photographs respectively purporting to be those of Mr. Roger Tichborne and of Sir Roger Tichborne, otherwise the Claimant. The portraits for which Mr. Tichborne sat, January 10th, 1854, blend with the most minute accuracy into one effective likeness, with either of those portraits, similarly enlarged, for which, after his return to England, the Claimant so frequently sat to Messrs. Maull and Co., and others, from 1867 to 1874. The facts here set forth are such as defy denial.

The present communication has been this day addressed to the several metropolitan daily journals and photographic periodicals, and will doubtless at once challenge the desired verification.—I am, sir, most respectfully yours,

5, The Royal Fort, Bristol. WILLIAM MATHews,
Inventor of the *Identiscope*.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

We subjoin a report, condensed from that in the Society's Journal, which has had the advantage of Captain Abney's supervision.

Mr. BERKELEY followed Captain Abney's paper by reading his remarks:—

You may, perhaps, remember that I expressed a wish at the commencement of my paper, read before this Society last June, that my "Notes" should introduce the subject of emulsions, and be the means of provoking a discussion upon them. I mention this as I consider that I have already had my say in the matter; also, because I have very little to add to the remarks then made. There are, nevertheless, one or two points which have partly cleared up since the date of writing my paper, and my opinion has been strengthened with regard to others.

I stated that the films I had obtained were coarser than those obtained by Captain Abney by the same method. At that time I had not seen any of Captain Abney's emulsions, and could therefore only judge from the results of a correspondence which passed between us on the subject.

During last summer I received from Captain Abney a bottle of his emulsion, which certainly transmitted green, or blueish-green rays; and I soon found that the bromide was considerably coarser than that which composed my orange emulsions. In my hands, too, it did not prove to be more sensitive than my own emulsions, though it is probable that his form of developer may account for this.

After this experience there appears to me no longer any need to speculate as to the cause of the thinness of image produced by those emulsions prepared by Captain Abney.

As to the cause of the comparative coarseness I am still rather obscure, but hazard the opinion that the albumen in fine division may, under certain circumstances, induce coarseness in the forming silver bromide.

I would also state that I have not the slightest doubt that the finest silver bromide transmits the most intense orange rays—I do not say "ruby," as I have doubts whether these rays always indicate extreme fineness.

I am sorry that I am not able to place before this meeting a series of experimental bromized plates, produced with nitrate baths of all strengths, and, I may add, all weaknesses.

These experiments have fully justified me in my belief upon three points, viz.:—1st. That coarseness of the bromide produces a film which transmits the more refrangible rays to the exclusion of the less refrangible. 2nd. That coarseness enhances the rapidity of a plate, probably by rendering it more open to the attack of the developer, the development being much more rapid. 3rd. That coarseness produces thinness of image.

Mr. W. BEDFORD submitted some negatives taken by the emulsion process for the inspection of the members. They were the results of some experiments made with Bolton's emulsion, which he first tried some three or four years ago, and knowing the subject was to be discussed this evening, brought them for the inspection of this meeting.

In reply to a question from the Chairman, Mr. Bedford said that the process he used consisted of an emulsion containing an excess of bromide of cadmium and ammonium. It was poured out on the plate, allowed to set, washed, and organic matter added if the nature of the pyroxyline used required it. He found that pyroxyline prepared with very weak acids was the most suitable. Accidentally mixing the acids too weak, as he supposed, the result, though somewhat wasteful, being only 50 per cent. of the original weight, proved the best he had used. The process, he thought, was a little slow, and he was now making some experiments with a view to securing greater rapidity.

In reply to Mr. Sebastian Davis, he (Mr. Bedford) said, the majority of the plates had been exposed ten minutes, and some a quarter of an hour, but the light was not good on that day. The results obtained by an excess of bromide excelled those with an excess of nitrate of silver, inasmuch as they were more certain and cleaner.

Mr. DAVIS was not quite certain he had understood Captain Abney right in respect to one of his experiments. Had he recommended the use of iodide or bromide of potassium?

Captain ABNEY replied that he had used bromide.

Mr. DAVIS remarked that the fact of bromide, and not iodide of potassium, being used, would considerably modify the observations he was about to make. Iodide of potassium, it was well known, had the effect of counteracting any impression made by light—indeed, the image might be nearly removed by it.

Captain ABNEY said that was so. The bromide not only would destroy the image, but in the case of bromo-iodide of silver it would eliminate the bromide, and an iodide of silver plate with an excess of soluble iodide present was perfectly insensitive.

Mr. JAMES HUGHES believed that in the experiments with Daguerreotype made by Mr. Shaw, of Birmingham, and referred to by Captain Abney, iodine, and not bromine, was used. It was recorded by Mr. Shaw towards the end of the Daguerreotype days, that gentleman being one of the last experimenters in that direction. Though he had recorded the fact, Mr. Shaw was by no means the first to adopt the use of iodine, for it was a common device in those days, when the photographer suspected that the sitter had moved, not to develop the plate, but to leave it for a very short time in the iodine box, when the image was removed and the plate again ready for use without any further treatment. Captain Abney had that evening brought some interesting experiments, and Mr. Bedford some excellent negatives, manipulated with his characteristic neatness. Mr. Bedford had, however, spoken of the slowness of the emulsion process he had used, and he should like to know from Mr. Bedford whether he had adopted any standard of rapidity, so that some definite ratio could be obtained. When we spoke of a process being "slow" or "quick" there was generally some standard existing in our minds resulting from our practice with the wet process. Perhaps Mr. Bedford would tell the meeting the degree of slowness he had noticed as compared with this standard.

Mr. BEDFORD observed that he should give his emulsion plates ten times the exposure of wet ones. It would be erring on the right side to give them more rather than less. Generally speaking, photographers had a tendency to over-rate the sensitiveness of dry plates, and, if there was some difficulty in the development, to jump to the conclusion that

* We print the word *bromide*, as it appears in the official report, but we presume *iodide* is meant.—ED. P.N.

they were over-exposed; when, if a little more time had been given, the results would have been more like those of wet plates.

Captain ABNEY observed, in reply to Mr. Hughes' remarks that he was not familiar with Daguerreotype practice as it existed at the time of Mr. Shaw. He had, however, read in the *Philosophical Magazine* a long paper of Mr. Shaw on the subject, and though of course he (Captain Abney) was open to correction, he believed that Mr. Shaw had stated that bromine* had the same effect as iodine in destroying the image. Personally he (Captain Abney) had no doubt that such was the case. He would also again observe that as the same effect produced in the film also applied to the emulsion itself, he could not see how any difficulty could arise leading to the rectification of fogged emulsion. In such a case there was nothing to do but to restore it, either by nitric acid or by the other combinations he had named. Iodine did not seem to destroy the sensitiveness; bromide perhaps did: at least, that was his experience. A quick emulsion fogged by light could be restored by iodine to its original rapidity. This did not apply to bromine, nor to the bromides of copper and sesalt. Nitric acid, however, did not affect sensitiveness.

Mr. NEMITT said he had made some experiments both in albumen and collodion emulsions. His first experiments were very successful, and he should think the plates were quite as sensitive as those by the wet process. The image, at first, was rather thin, but easily strengthened on intensifying. He had noticed, however, that the film was very coarse, much coarser than those prepared with excess of bromide. One drawback was that in developing there was a tendency to blister under the action of the alcohol flowed over previous to development. The film also lacked tenacity. This was sometimes cured by adding a very small quantity of ordinary emulsion, but the blisters still appeared, and in order to get rid of them entirely, he had to mix a suitable preparation of simple washed emulsion.

Mr. HENRY had tried, in conjunction with a friend, the emulsion process in competition with the wet. He took some emulsion prepared by himself, with plain bromide of zinc, and some of Warnerke's. The lens used was Dallmeyer's stereo lens, and in each case his friend was the operator, he himself being the sitter. Each plate was developed at once, and on comparison, very little preference could be given to the wet.

Mr. KENNETT said that as for years he had been using gelatine, he was almost out of collodion work. He could, however, venture to say that he could prepare plates quite as rapid as those by the wet, and was ready to accept any challenge as to comparative quickness. He had sent some plates recently to a gentleman in the country, and he had the satisfaction of hearing that they had been pitted against wet plates, to the disadvantage of the latter. There was more detail in the shadows, while being equal in the lights and other parts. He was, therefore, satisfied that dry plates could be prepared equal to wet ones.

The SECRETARY here said he had received a letter from Mr. Leon Warnerke, expressing regret at his inability to be present at the discussion, owing to absence abroad.

The CHAIRMAN thought there could be no doubt as to one advantage which emulsion plates possessed, inasmuch as the quantities were fixed and known, instead of varying from time to time, as in the wet process. He had had very little experience in the emulsion process, and was anxious for information. He should be glad to know how far it differed in the matter of development from the wet process, whether the time was much longer, and whether the development was capable of remedying any fault, either of over or under-exposure. To know something on these points would be very interesting to those who were not familiar with emulsion.

Mr. KENNETT could only speak of gelatine emulsions, but as far as this was concerned the development averaged from three to five minutes. He looked for the image to appear in about forty seconds. If it appeared in that time all went on well; if it took longer, or appeared sooner than this time, the plate was under or over-exposed. For the full development to the proper intensity three minutes should be quite sufficient.

* Since the discussion we have referred to the original paper by Mr. Shaw and find that the destruction of the image was caused by bromine or iodine indifferently.—EDITOR.

Mr. W. BEDFORD said the collodion emulsion plates developed quickly with ammonia, but took longer if intensified, or if pyro and silver were used. Generally speaking, the development would take rather longer than that of a wet plate. In making this comparison, however, it should be remembered that the wet development differed in time, some portraitists using a developer that produced a very thin image requiring much intensification. Of gelatine plates he had had very little experience, but agreed with Mr. Kennett that they were certainly very rapid. He believed, however, that no experimentalists had succeeded in making plates so rapid as Mr. Kennett's. As his process was not known, there were no means of experimenting with it.

Mr. ENGLAND remarked that where the exposure was ample the development did not take longer than in the wet process; but where the exposure was not sufficient, it took more time and required more care.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of this Society was held on the 10th inst.—Mr. T. SORWITZ, M.A., F.R.S., &c., in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected: Messrs. J. W. Leigh, P. B. Bury, S. F. Riddafoord, M. Coventry, and J. D. Radcliffe.

The SECRETARY then laid before the Council the prizes (which were approved) as follows:—A large silver goblet for Dr. Cooke, first prize; a silver goblet for Mr. R. O. Milne; a ditto for Mr. W. B. Hobson; an oil painting (by Masters) for Major Chadwick; a ditto for Dr. Cooke; a ditto for Mr. T. Brownrigg; a ditto (by Fruch) for Mr. J. C. Stanning; a ditto (by McEvoy) for Mr. F. Adderley; a ditto for Lieut. Fairlough; an album elegantly bound in ramia, for Mr. F. Beasley; a ditto, in morocco, for Mr. B. Beasley; a ditto for Mr. W. Vanner; a ditto for Mr. R. O. Milne.

At the conclusion of the meeting a vote of thanks to the Chairman having been proposed by Mr. JAMES GLAISHER, and seconded by Sir ANTONIO HADBY, was passed by the meeting.

A. J. MELLUMS, Hon. Sec.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE first popular meeting of the season was held in Queen Street Hall, on the evening of Thursday, the 18th inst., when the attendance of members and the general public was, as usual, very large.

The pictures, kindly lent by Mr. F. York, of 87, Lancaster Road, London, were illustrative of a journey from London to the Falls of Niagara, and the lecturer of the society (Dr. John Nicol) officiated as expositor.

The Lecturer, after an introduction, in which the facilities for travelling during the past and present times were humorously characterized, and the ease and economy with which a trip to the New World can be made, and the benefits likely to arise from it were pointed out, took his audience in imagination from Euston Station to Dublin, and from thence to Queenstown, where they went on board one of the Cunard liners. The many pleasures and some discomforts of a trans-Atlantic voyage were then touched upon, and the party were supposed to arrive in Jersey Harbour. Crossing to New York afforded an opportunity of seeing the ferry boats, and then the extensive shipping of that city. Several of the principal streets and buildings were passed rapidly under review, and some fine pictures of the great central park, said by the lecturer to be perhaps the finest park in the world, were shown on the screen.

These were followed by a series of views of the Hudson, and Catskill Mountains, including some fine waterfalls; Lake George, Rochester, and so on to Niagara, a number of very fine pictures of which were shown, taken during various seasons, and from most of the best points of view. The exhibition closed with some pictures of Washington, the Capital and Patent Office being especially effective. Additional interest was given to the lecture by the introduction of a number of personal reminiscences, and as the pictures were coloured—an innovation regarding the result of which the lecturer at the commencement expressed a doubt—they were much appreciated by the audience generally.

Talk in the Studio.

ENGRAVING WITH ELECTRICITY.—The applications of electricity seem to be unlimited. We are informed that an ingenious inventor has succeeded, after many tedious trials, in constructing a machine for engraving by means of electricity. The design is placed under one, and the plate to be engraved under the other pole of the battery, the latter being supplied with the engraving tool. When the battery is set in action, an ivory button moves horizontally over the design, and since the latter is made a conductor, thereby closes the circuit and affects the metal under the other pole, producing a facsimile on the plate. If it be desired to produce a relief plate, it is only necessary to reverse the poles of the battery, and the functions performed on the design and plate will be reversed likewise.—*Papier Zig.*

DEXTRINE MUCILAGE.—As an adhesive, dextrine is superior to gum-arabic in many instances. It is used for preparing the mucilage on backs of postage stamps and on the edges of envelopes. As a label paste, particularly on glassware, it forms an excellent mucilage.

Dextrine...	...	...	2 ounces.
Acetic acid	...	...	1 ounce.
Water	...	...	5 ounces.
Alcohol	...	...	1 ounce.

The dextrine should be dissolved in the water and acid by means of a water-bath, and the alcohol added afterwards.—*Druggists' Advertiser.*

To Correspondents

LOUISE DAVEY.—We cannot give you precise information as to the cost of apparatus for portraiture by the electric light; probably about £200—more rather than less.

H. K.—See answer above. We have no certain data upon which to base an answer.

R. S. S.—The instructions generally are, we believe, very good; but we cannot by any means endorse the whole of them. That you quote we cannot approve, either as to method or as to formula. We prefer four ounces of hypo to a pint of water. In warm weather it may be (without disadvantage) reduced a little; but in no case to such an extent as that quoted, without risk. A saturated solution means, of course, as much as the liquid will take up and hold in solution. Hyposulphite of soda is soluble in less than its own weight of water, and bicarbonate of soda in thirteen parts of cold water.

R. T.—The porous quality of a collodion film depends much upon the character of the pyroxyline. To secure a powdery film, the cotton should be immersed in weak acids at a high temperature. We have obtained a good powdery sample by using sulphuric acid at 1840 sp. gr., and nitric acid at 1420 sp. gr., at a temperature of 180° Fahrenheit. It is possible also to make a horny collodion powdery either by agitating it with carbonate of soda, or adding a few drops of water to it. Care and experience are necessary to hit the precise proportion. Age will also tend to produce a powdery condition.

A. M.—We have published various formulae for waxing solutions in the *News*. We cannot tell to which you refer in your somewhat indefinite allusion. You should preserve the *News*, and then you would be able to refer back, as we should have to do. All the formulae depend on dissolving wax in an essential oil, and for this purpose you will find oil of spike or oil of rosemary will answer.

A. W.—There are many sources of fog, but it is difficult to say which is troubling you. The use of a new colourless collodion is a common cause. The addition of a little old collodion, or of a little tincture of iodine, will in such case effect a cure. Sometimes the vapour of ammonia or other alkali will cause fog. Some times burning gas in the dark room will cause it: an escape of foul air into the dark room will sometimes serve. We have known it to arise from a newly whitewashed wall in the dark room. An impure sample of acetic acid in the developer will at times cause the trouble.

A. BRAUN & Co.—Many thanks. The print arrived safe, and was, we think, acknowledged in the following number. It is a magnificent specimen of carbon printing. If we can get the strips you mention, we will send.

PHOTO-NEWS MAN.—To give you fully detailed information and formulae for the processes about which you inquire would require more space than is at our command in this column. Iodized paper does not require keeping from the light until it is made sensitive by the silver bath. But it is not a process of enlargement which we recommend now that much better processes are familiar. 2. It is possible to enlarge direct on artists' canvas, and we have given repeated instructions; but it is not a safe process, as the canvas cannot be washed after fixing as thoroughly as it ought to be. For enlargements on artists' canvas, carbon only should be used, and that is quite available. 3. The *Year-Book* will be out at the end of the year. The publication of any of the good pictures at the Exhibition would be almost impossible, as Exhibition pictures are generally of large size, and a reduced copy would not do them justice.

Z. A. Z.—The general tendency of a strong iron developer is to give harmony and reduce contrasts; and of a weak developer to exaggerate contrasts. Hence the house, partly in sunlight and partly in shade, will be best treated with a strong developer. We dealt with this subject tolerably thoroughly some years ago in the *News*. We cannot discuss the question at length here, but may briefly point out the philosophy of the proposition. The image in a negative is chiefly formed from the free nitrate resting on the plate, which is precipitated by the developer wherever the action of light has produced an effect on the sensitive plate. A strong developer throws down the silver rapidly in the ratio in which light has acted; but a weak developer, acting slowly, gives time for another tendency to intervene. There is also a tendency in the free silver on the plate to aggregate, depositing most rapidly on those parts where the action of light has been strongest. Hence the highest lights appear first, and the silver keeps aggregating in those portions, so that they become very dense, whilst in the shadows, where light has scarcely acted at all, there is very little deposit of silver, sometimes insufficient to give the detail in the shadows any printing value at all. Hence this weak developer tends to the production of strong contrasts.

DUBLIN.—Success in the use of a burnisher is very much dependant upon careful and skilful manipulation, which is acquired by a little practice. Take care that the adjustment is true, so that the rollers not tighter at one end than the other, and take care to see that the burnishing edge is clean, free from dust or dirt, or scratches will result. Commence with a waste card or two, so as not to subject good cards to risk.

M. C. ALLEN.—Perfectly clean rain water will answer well for washing prints.

ALPHA.—We regret that we cannot tell you where it may be purchased.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

- Mr. H. P. ROBERTSON, Tunbridge Wells,
Photograph entitled "When the Day's Work is Done."
- Mr. GUYTON, Burford Oxon,
Photograph of Rev. W. A. Cass.
- Mr. LEAD, Huddersfield,
Five Photographs of John Roseberry.
- Mr. W. G. LEWIS, Bath,
Photograph of Rev. H. Woodhouse.
Photograph of Rev. C. Quick.
- Mr. HOULEAT, Abbeysenny,
Four Photographs of Abbey Church and Monastery, at Llanthony.
- Mr. J. JACKSON, B. shd-le,
Two Photographs of John Bright.
- Mr. G. W. GARRIN, St. Helen's,
Two Photographs of Rev. T. Ullathorne.
- Messrs. J. YEMAN and Co., Bedale,
Photograph of Thorpe Farrow Gardens.
- Mr. E. S. CLOWSE, Walworth Road,
Photograph of Alice Rhodes.
- Mr. F. DOWNS, Watford,
Photograph of Mr. Oscar Moore, Clayton.
- Mr. OAKLEY, Southampton,
Photograph of General and Mrs. U.S. Grant and three others.
- Mr. D. MANNING, G. Jashella,
Three Photographs of Rev. Robert Blackstock.
- Mr. R. SHERBURY, Lincoln,
Photograph entitled "Alone."
- Messrs. SYMONDS and Co., Portsmouth,
Photographic Portrait of Princess of Wales on board the Royal Yacht Osborne.

The Photographic News.

Vol. XXI. No. 1008—DECEMBER 28, 1877.

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DO CARBON PRINTS FADE?

As the primary claim made for carbon prints upon the attention of photographers was based upon their absolute permanence, it is not unnatural that the basis of the claim itself should be closely challenged. It has frequently been asked. How are we to know that these prints will be more permanent than those of silver until they have been as long and as severely tried? The question at first sight seems pertinent enough. But a little reflection shows that so far as it is regarded as involving an argument it is fallacious. It is easy to determine *a priori* that the chances of a permanency for an image formed of silver are very doubtful, as few things discolour so soon as articles, in the shape of table silver, &c., formed of silver; whereas, on the other hand, carbon as a pigment possesses well-known permanency, and, in the form of printing ink, has stood for centuries in the shape of books and engravings. Objectors, it is true, tell us that it is not the carbon, but its vehicle, gelatine, which is doubtful. It is quite true that gelatine, as gelatine, is perishable; but gelatine transformed by certain agencies into an insoluble substance is one of the most durable bodies we know. Leather is practically gelatine made insoluble; and, traditionally, "there is nothing like leather!" Then parchment or vellum, chosen as the repository of the most important deeds and documents, is simply gelatine rendered insoluble. So that, from arguments based upon experience and analogy, it is quite fair to predicate permanency for carbon prints.

But at this point we are reminded that we are called upon to deal with facts, and not with arguments based upon theoretical considerations. A correspondent sends us some examples of carbon printing which are indeed in a very dilapidated condition. They are cracked and blistered, and the tint of the shadows is a dull, cold, greyish-black, with an uncomfortable green tint running through the whole. Our correspondent calls them "chromotypes," and he is, we presume, a Lambert licensee. He is clearly, as he admits, a young hand at carbon printing, and he fears that if the sample he sends us is anything like typical of what he may expect from his other work by the same process, he is not likely to be a much older carbon printer, as he should give it up at once if he were convinced that this is the legitimate and natural issue of his chromotype work. And he would doubtless do very wisely! But he knows well that it is nothing of the kind. He knows, probably, better than we do, the agencies which have wrought dire results. The final cause of the dilapidations in his prints is bad treatment. They have been subjected to conditions to which no work of art should be submitted. They have probably been in a specimen case hung outside constantly subjected to a damp atmosphere, and this has been alternated to the unsubdued glare of a south sun. We speak with confidence on this point, as the only carbon prints we ever saw in the same cracked and blistered condition were some in a specimen case hanging on a marine pier, with a midsummer sun beating on them nearly all day, and the damp of the sea atmosphere generally pervading the case. An oil painting placed in the same position would have been still more thoroughly destroyed. The most durable things in the

world suffer if placed in unfair conditions. A case recently came under our attention in which a diamond, perhaps the most imperishable thing in the world, was destroyed by a little carelessness. A handsome stone weighing ten carats was placed in the hands of a jeweller to set, an especial caution against applying heat being given. The experienced workman, knowing, as he believed, better than those who instructed him, did apply heat, and the diamond flew into a thousand worthless fragments. A point of curiosity, for which it had been bought, was the presence of a minute drop of liquid in the centre, and this, converted into steam by the heat, exploded and destroyed the stone. But this afforded no argument against the permanency of the diamond.

The bad colour of the prints submitted to us was doubtless due to the imprudent use of carmine in the tissue, to gain a fine rosy bloom; and this fugitive pigment faded in sunlight. The greenish tint is due to imperfect washing of the print after the image was brought out. Some traces of the chromic salt remain, which gives the objectionable tint visible when the rosy hue is gone. For the rest, our correspondent, we think, knows more than he assumes, and is indulging in a little "chaff." Mr Johnson's new method will give him rosy blacks without the use of fugitive colours. Has our correspondent been reading the amusingly weak and foolish arguments which some of the American opponents of carbon have been using?

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

ENGLISH *versus* FRENCH WEIGHTS AND MEASURES—THE ELECTRIC LIGHT IN PHOTOGRAPHY—AUTHORS AND THEIR PHOTOGRAPHIC NOTES—CHRISTMAS AND NEW YEAR CARDS.

English versus French Weights and Measures.—In Germany they are calling out about our weights and measures, and puzzling themselves over the British pound and the British ounce. A pound, our German cousins say, may mean either twelve or sixteen ounces, and an English ounce varies from 437½ to 480 grains. The grain is, we are told by our critics, the only trustworthy weight we have. The censor might have gone still further, and arraigned us upon a long list of similar crimes, for weights and measures are certainly a weak point with us. Fortunately we have of late in this country recognised the French system, and our chemists, as also those of Germany, have stated their results in grammes and centimetres. Thus scientific publications, whether in French, German, or English, have recently stated weights and measures in a common language, and the scientific men of those countries having recognised such data, there will in future be no misunderstandings. Some of our correspondents have asked us why we have not given foreign photographic formula in British grains and ounces, instead of grammes and centimetres, but the reason is obvious. In the first place, our own weights are uncertain; and secondly, the matter would not be made clearer to those who occupy themselves with chemistry or photo-chemistry. If you purchase chemical weights and chemical measures from any high-class dealer in this country, he will recommend the adoption of gramme weights and cubic centimetre measures as being the standards now adopted, not only by British chemists, but, as we have said, by the French, German, and probably every scientific man of the present day. Papers read before the Royal or Chemical Societies of London will be found to have all formulæ and results expressed in these universal terms, and photographers, therefore, must make up their minds to follow suit. When once they are provided with gramme weights and cubic centimetre measurements, they will find affairs much simplified, for instead of going into abstruse calculations, turning ounces into grains and grains into grammes, or estimating cubic centimetres at so many "drops," whatever they may mean, they can at once make up a formula, whether the same comes from France, Germany, or elsewhere. Fahrenheit degrees, so much in use with us, and those of Reaumur,

with which the Germans are cognisant, are rapidly giving way to the French method of calculating by the aid of a centigrade thermometer, these degrees being divided into tenths in the case of very delicate readings being necessary. In a word, we are adopting French science, as we adopt French fashions and many things else that are French; not, it will be found, simply for the purpose of gratifying a whim, but because their decimal system is the best and soundest. Nobody can have a greater disinclination than the German to adopt anything Gallic, but in spite of himself he does it. One word in twenty which a fashionable Berliner utters nowadays is French, or of French extraction, and kilogrammes and kilometres are everywhere to be found throughout the great Fatherland. A shopkeeper in Germany asks you whether you desire a kilometre or half a kilometre of chocolate, and a Teuton peasant of whom you ask your way will respond with the distance in kilometres. If our German cousins adopt French measurements in this way, we may be quite sure it is right so to do. French has long been the diplomatic language, as it has been that of telegraphy and all sorts of international communications; it is now the language of science.

The Electric Light in Photography.—The attempt once more to use the electric light in photography, as evinced by Mr. Vanderweyde, is certainly a plucky proceeding. Woodbury, Disderi, Goupil, and other photographers have already employed this wonderful agency in their work, and let us hope that Mr. Vanderweyde will be more successful than his predecessors. They all employed the electric spark for printing purposes, while he, as our readers know, uses it for securing portraits in the camera. He has not been able to avail himself, seemingly, of the electric candle of which we have spoken in these columns, and which promised so well as a means for bringing electric illumination into every-day use. We suppose there is some hitch in the practical working out of such a charming invention, for otherwise Mr. Vanderweyde would have availed himself of it, as he had intended. The electric candle, in which the light emitted comes from kaolin in a state of fusion, gives a far softer light than that emitted from charcoal points, and hence it would have been well suited for the particular purpose of Mr. Vanderweyde. That gentleman, however, readily gets over the vividness of his electric lamp by throwing the light first of all upon a matt white surface which does not reflect the rays too intensely. If the electric candle cannot be introduced practically, we shall apparently be as far off as ever from the general introduction of electric illumination of our bridges, theatres, public halls, &c.

Authors and their Photographic Notes.—Painters, we know very well, find photographs very useful to convey ideas and to remind them of effects, but it is not generally known that authors also find camera pictures particularly helpful in descriptions of scenery. When looking at a fine bit of country we may enjoy its aspect to the full, and yet be quite unable to say at the moment what it is that affords the pleasure. Or, we cannot, may be, tell to another what we have observed in order that he may feel something of the impression that has been made on our own mind. Now a photograph prompts one's memory wonderfully. You have seen a stretch of woodland and river, a leafy dale, or a silvery pinnacle of grey rock rising above a black forest of firs. It is not the one element or the other that has made the picture, but some of the minor points upon which your eyes scarcely rested. Yet had you a photograph at your elbow, it would not be difficult for you, doubtless, to reproduce the scene in a few words. The lights and the shadows have far more to do in making up the picture than you had ever supposed. Contrast has contributed very largely to the result, and thus you can write of broad deep shadows and bright patches of light of the existence of which in detail you had before no conception. You lack the colour in the photograph, but you must sacrifice something. Had you a water-colour sketch before you, the chances are that a good deal of truth would also be lacking. Neither photograph or sketch would be perfect in their way, but in the case of

an author who wishes to recall to his mind a certain scene and describe it in words, the photograph, if a good one, would be much the more useful. A picture of this kind is better than a page full of notes in the author's diary.

THEORY OF THE DESTRUCTION OF THE PHOTOGRAPHIC IMAGE BY TIME.

BY CAPT. ABNEY, R.E., F.R.S.

I WISH to make a few remarks on a subject kindred to that of my last paper which was read before the Photographic Society, and which appeared in your issue of last week. Since its reading I have undertaken further experiments with a view of ascertaining the cause of the fading away of the undeveloped image impressed on dry plates by long keeping after exposure. It will be quite evident that none of those agents that I previously used for eliminating fog or destroying the image could cause this gradual fading away. Reasoning from the fact that nitric acid was effective with silver bromide, it struck me that it might be possible to oxidize the loose atom of silver in the sub-bromide (Ag_2Br) and even in the sub-iodide (Ag_2I) of that metal, if the chemical theory of the photographic image held good. Films of pure silver iodide and of pure silver bromide, after exposure under proper conditions, were washed and treated with potassium bichromate, potassium permanganate, and chromic acid. With the first named silver salt all were effective in destroying the image. With the latter silver salt the last two oxidizing agents alone were effective, the permanganate requiring a longish application.

Now if this destruction were caused by an oxidation of the silver atom, it should also be capable of being oxidized by ozone, since metallic silver when moistened can be peroxidized by it.

To test this, plates were prepared, exposed, and left to the action of ozone, and in every case when proper precautions were taken the image was entirely destroyed. The oxidized films (however oxidized) were all capable of receiving fresh light images which could be developed free from fog.

Is it too much, then, to assume that the effect of time on the image impressed on a dry plate is to oxidize an atom of each of the molecules forming the image; particularly when it is found that nascent hydrogen is capable of restoring it to a certain extent, though its perfection is marred by the reducing action of the hydrogen on the whole of the salt in the film?

I wish, also, to note an experiment which I made some short time ago, and which struck me forcibly at the time. Two plates were prepared with rather thick emulsion, and exposed to a gas flame behind a negative for equal times: one was immediately developed and gave a good picture, whilst the other was put away in my dark room for a couple of months. On attempting to develop this latter, the image refused, apparently, to show at all; but on turning it over and looking through the glass, an image was seen developing next to its surface. Eventually the image worked its way up to the top surface, and remained as an under-exposed picture. The atmospheric influences had evidently not had time to penetrate so far as the light, which latter must have been much enfeebled as it arrived near the back of the film; and hence on developing showed signs of under-exposure.

Is it not probable that the keeping qualities of certain plates when washed over with gallic acid may be due to an oxygen absorber being present, which the atmosphere must first saturate before it can hope to attack the silver image? Apparently a preservative for a dry plate should be impervious to the air, and for double security it may be presumed it should contain some substance more readily oxidized than the atoms forming the image. I am keeping some plates in hydrogen and nitrogen, which, after a couple of months, will be developed in competition with some exposed to the air in the usual manner.

RETOUCHING.

BY NORMAN MAY.*

A KIND of extempore and temporary desk for night work I once made; at least, it was intended for a temporary one, but it answered its purpose so well that it was in use a couple of years, and some hundreds of negatives were touched on it. Rather a primitive affair, consisting only of two pieces of three-quarter-inch board, one about eighteen inches by twelve, and the other eighteen by four. A hole was cut in the centre of the larger piece, and the two pieces were joined together by a couple of hinges lengthwise, folding together when not in use, and leaving the boards at right angles when opened. A knife, with two broken blades, did duty as a support at the right hand end, or side, and with a sheet of oiled tissue paper my desk was complete—rude and unfinished looking, perhaps, but still answering its purpose well.

The light I found the steadiest, and with absolutely no flickering, such as gas generally gives, was that obtained by one of Hink's hanging lamps, with reflector, costing about five shillings. It has an inch wick, which is better turned "edge on" to the negative. The light in my lamp is about on a level with the bottom of the retouching desk (which can be arranged by raising the desk), and about six inches from the negative, thus occupying the same place a mirror would in working by daylight.

I find it necessary, with all but very much over-exposed and over-intensified negatives, to use oiled tissue-paper or ground glass between the negative and light for night even more than day work. That, in a great measure, relieves the eyes from the stain and glare that seem almost inseparable from night work, even with the best of appliances; but, both for comfort and excellence of results, daylight is much to be preferred.

Blacklead pencils are more generally used, and rightly so, as mistakes are much less likely to be made than with colour, though some negatives are exquisitely retouched with colour, the tone of the negative being theoretically the proper one; but a colour that gives good results in experienced hands is rose or pink madder, as it is very workable, and semi-transparent or opaque as required. Crimson lake and carmine, though easy to work, must by all means be avoided, as being very fugitive colours. In a few days of sunlight the retouching will disappear slowly but surely.

"Gritty" colours should be tabooed for this kind of work, and by putting the brush in the mouth as rarely as possible you will not be so likely to have the retouching come off in patches or run down "all of a heap." A tumbler of water is a much better and safer thing to moisten the brush with, though as little water as possible should be used if you wish to avoid the water going on in a globule and drying like a pond with a shore round it.

With a hard spirit varnish, and roughened surface, an HHH, HH, or H pencil will be found to answer admirably; B and BB pencils being suitable only for the broader touches. Various substances are recommended for abrading the surface—cuttlefish bone powdered, rouge, bath brick, and pumice powders and other articles too numerous to mention; but powdered resin will answer perfectly for most varnishes, being less liable to scratch, and giving a more tacky surface than cuttlefish bone. Excellent retouching is done on gum-arabic, but as the spirit varnish applied afterwards does not always penetrate the film, there is an increased danger of it (the film) swelling or contracting with atmospheric changes in storage. Bichromated gum would also be liable, though in a less degree, perhaps, to this danger. Varnishing with an ether or benzole varnish finds favour with many, not the least of its advantages being the protection afforded the retouched film by the coating of spirit varnish which follows. Ether varnishes are liable to dissolve the collodion film. A varnish good, cheap, and well tried, is the one so often recom-

mended, of a mixture of white hard varnish (used by house painters) and methylated spirit. Care must be taken that the varnish is pure, or when mixed with spirit it will be found to curdle, rendering filtration almost an impossibility. This varnish can be worked on either with a roughened surface or without one. Negatives retouched after the final varnishing, and roughened, are liable to have the silver stick to the surface, causing in time the retouching to look much worse than in the proof, and degenerating, if a great number of proofs are required, into a series of white dots.

A benzole, ether, or chloroform varnish, or gum, is undoubtedly of great benefit if it can be procured and applied of sufficient hardness and pureness of texture to allow of delicate touches with the sharply-pointed pencils found necessary for successful retouching.

Every photographer differs, sometimes slightly, often widely, from another's practice, and some find things work well in their hands that another fails lamentably with. There is no royal road to retouching. Practice and experience are great essentials; artistic knowledge scarcely, if at all, less so.

"UNIVERSAL ART INVENTORY."*

[THE information given in the following article, which appeared in the *Times*, cannot fail to interest all art students. A feeling of regret will impress many of our readers that an inventory so interesting and valuable should not have been made more so by photographic illustrations at least of the most important art treasures.]

We lately had occasion to speak of the "*Inventaire Général des Richesses d'Art de la France*"—a publication recently issued by the French Government. As then stated, the object of that publication is to supply France with an Inventory of important Art Treasures, which are considered to be national property, and its compilation seems to have been suggested by a work our own Government began some twelve years ago, which we have now before us. It is a copy of two parts of an Universal Art Inventory, consisting of brief notes of works of Fine and Ornamental Art executed before A.D. 1800, chiefly to be found in Europe, especially in connexion with architecture. It is published by the Science and Art Department.

The idea of producing such a work appears to have grown out of the scheme, which the Department at Kensington may be said to have originated, of obtaining reproductions of all kinds of fine art objects. As early as 1864, ten years prior to the conception in France of an "*Inventaire Général*," Lord Granville, who was then Lord President of the Council—the Minister charged to control the development of the Kensington Museum—moved Earl Russell to communicate with Her Majesty's representatives at Paris, Dresden, Berlin, Munich, Turin, and Rome, and to request them to obtain printed catalogues of the collections of fine art works which are displayed in the various great galleries and museums throughout the Continent. It was hoped that by this means the South Kensington Museum would secure sound information about objects which, although they might be unpurchaseable, might be reproduced. Considerable correspondence on the subject appears to have ensued, if we are to judge by the various despatches published in the form of an appendix to the "*Universal Art Inventory*." France appears to have made no reply to the communication, and yet is, oddly enough, the first of the foreign Governments to act upon the English suggestion. The large work of starting an organization for reproducing all kinds of fine historical monuments and works of art seems to have taken its first important shape in a "*Convention for Promoting*

* Science and Art Department. "*Universal Art Inventory*," consisting of brief notes of Fine and Ornamental Art executed before the year 1800 chiefly to be found in Europe, especially in connexion with Architecture, and for the most part in Ecclesiastical Buildings; compiled for the use of the South Kensington Museum and the Schools of Art in the United Kingdom by H. Lindsay Cole, and edited by Sir Henry Cole, K.C.B., late Director of the South Kensington Museum. London: Printed by George E. Eyre and William Spottiswoode, Printers to the Queen's Most Excellent Majesty for Her Majesty's Stationery Office. Part I. (1870), containing Mosaics and Stained Glass, price 2s. 6d. Part II. (1876), containing Goldsmiths' Work, and Enamels and Ivories.

Universally Reproductions of Works of Art for the Benefit of Museums of all Countries." This Convention was entered into by several princes of the reigning houses of Europe in 1867, his Royal Highness the Prince of Wales taking the initiative in the matter. The text of the Convention is given in the appendix of the "Universal Art Inventory," and the signatories of this document were Albert Edward, Prince of Wales; Alfred, Duke of Edinburgh; Frederick William, Crown Prince of Prussia; Louis, Prince of Hesse; Albert, Prince Royal of Saxony; Prince Napoleon (Jérôme); Philippe, Comte de Flandre; the Césarewitch; Nicholas, Duke of Leuchtenberg; Oscar, Prince of Sweden and Norway; Humbert, Prince Royal of Italy; Amadeus, Duke of Aosta; Charles Louis, Archduke of Austria; Rainer, Archduke of Austria; Frederick, Crown Prince of Denmark.

The first fruits of the Royal and Imperial co-operation for the benefit of Art Education may be seen at the South Kensington Museum. There are reproductions of the great mantelpiece in the Palais de Justice at Bruges; of the Tabernacle or Sacramenthaus at St. Léau—an elaborate piece of 16th century sculpturing by Corneille de Vriendt, and upwards of 40ft. in height; of the Eastern Gateway of the Sanchi Tope—a Buddhist work of the 1st century; of the noted Trajan's Column at Rome—a work of the 2nd century; of portions of the cloisters of San Juan de los Reyes at Toledo; of the Schreyer Monument by Adam Kraft at Nuremberg; of the Corona Lucis of the Cathedral at Hildesheim; of the Bayeux Tapestry; and of scores of other equally interesting monuments and works of art, which presumably are never likely to quit their homes or get into the market for sale.

To return, however to the "Universal Art Inventory"—in the notice to the catalogue, Sir Henry Cole, who has volunteered to be the editor, assisted in the compilation by his daughter, Miss Henrietta Lindsay Cole, says that the work must be considered as little more than a beginning, and he invites additions and corrections. Many well-known artistic connoisseurs, such as Mr. Rawdon Brown, Signor Castellani, Mr. Drury Fortnum, Mr. A. W. Franks, The Right Hon. H. A. Layard, Mr. L. Gruener, M. Emile Trelat, Mr. John Webb, and M. Ernest Vinet have given their assistance in making the first instalments of the catalogue as complete as may be. But there naturally remains very much to be done before the Inventory can be brought up to an approximately complete state. The new French publication will be of material assistance in giving new information. If other countries can spare a little attention to such matters, the time need not be far distant when there shall be Germans, Italian, Spanish, Austrian, Russian, Belgian, and other inventories of national treasures for the information of all schools of art in the world. England, as the progenitor of the idea, will continue her work, already well in hand, and will profit by such national inventories. Of what immense educational value would not inventories of Egyptian, Grecian, Etruscan, and Roman works have been, had copies been obtainable at the present day!

The "Universal Art Inventory" is split up into sections or classes of art works as follows:—Mosaics, stained and painted glass; general metal work, including ironwork; bronzes, goldsmiths' work, wood carving, paintings of a monumental character, enamels, arms, armour and accoutrements, jewelry, ivories, woodwork, &c. The first part, allotted to mosaics and stained glass, was published in 1870. In it we find condensed notes of the most interesting relics of bygone times, such as the mosaics in the Basilica of the Lateran Chapel of the Corsini, at Rome, which date from 461 A.D.; mosaic pavements of the 4th century in the ruins of the Church of St. Cyprian at Carthage; and mosaic decorations of the walls of the church of St. Apollinare Nuovo at Ravenna, Italy, dating from A.D. 570. In fact, in however crude a state the Inventory may be, we have, in a shape easy to consult, brief notes of remarkable mosaics to be seen at the present day in buildings ranging from Agra to Lisbon, from Carthage to Kiev. The scope of the Inventory in respect of stained and painted glass is not less comprehensive. The Inventory is fairly entitled to be called universal, and the value of the work as commenced must increase as long as the idea is entertained by the Lords of the Committee of Council of adding to it and revising it from time to time. The work of revision will naturally necessitate close attention and careful supervision. Still, the nearer the Inventory is brought to a complete form, the more beholden will the country be to "My Lords" for having prosecuted in a

dauntless way an almost appalling task. To make a start was naturally the most difficult stage in the compilation of the Inventory. But the first plunge has been well taken, and My Lords have a clear course to steer in regard to their future editions of the Inventory.

The second part of the Inventory is devoted to goldsmiths' work, enamels, and ivories. This part was published in 1874. The same method of compilation as obtained in respect of mosaics has been adopted in this section. We have records of treasures which to many travellers are unknown, or which, at least, have been unheeded. Who, except the few diligent students of such treasures, are acquainted with the various reliquaries, crucifixes, and other ecclesiastical adornments which abound in the Treasury at Quedlinburg, in Prussia? The "Universal Art Inventory" contains a succession of entries about these objects, apparently more numerous than the magnificent collection of historical relics—works of the goldsmith and enameller—in the Bibliothèque Nationale at Paris. Then we find more than half a page devoted to the collection of Prince Hohenzollern at Sigmaringen, in Wurtemberg, to say nothing of descriptions of sumptuous works at Namur, at Munich (the Rich Chapel), at Milan (the Duomo), at Lisbon, in the Palace of the Necessidades. In truth, the more one dips into the pages of this "Universal Art Inventory," the more satisfied one becomes of the inexhaustibleness of the study of art history as substantially exemplified all over the Continent. One is tempted to linger over the terse descriptions of individual objects which may have formed the *points d'appui*, so to speak, of one or other of our tours abroad, such, for instance, as the delicate works of Wenzel Jamnitzer, a German Cellini, whose *capo d'opera* is at present in the collection of the banker, Merkl, at Nuremberg. So elegant and finished were the works of this goldsmith, that beaten and chased silver cups of his making have been held by many to be genuine works of the better-known Cellini. A fair though small specimen of this art workman's work is in the Kensington Museum. But we must not diverge from the main consideration before us.

Part 3 of the "Universal Art Inventory" is to be devoted to iron and other metal works; Part 4 to woodwork and sculpture. The last two parts are announced as being in the press. When these are issued the whole volume will form a good foundation for the subsequent complete Inventory. To avoid the charge of publishing incomplete for complete work, the first issue of the "Universal Art Inventory" is prudently marked "under revision." In this state we have reason to believe that it is being circulated among various foreign Governments, in accordance with Sir Henry Cole's suggestion of 1864. In the meantime, there is plenty of work to be done at home in the way of completing the British portion of this "Universal Art Inventory"—a fact which the Lords of the Committee of Council have duly recognized by appending to the metal work section a list of gold and silver plate belonging to the universities and other corporate bodies in the United Kingdom.

In concluding this cursory review of a valuable piece of work, we cannot overlook the variation in price at which the parts of the Inventory are published. As the title-page tells us, the work is compiled for the use of the schools of art in the United Kingdom and for the South Kensington Museum. It is an official publication, not undertaken for the sake of direct pecuniary profit. It is a national work for national use. Why is it, then, that the Stationery Office sells the first part of the Inventory, consisting of 150 pages, at 2s. 6d. a copy, whereas the second part, consisting of 197 pages, is published at four times the price of the first part—viz., 10s. a copy? This official publication is not a speculation. If the cost of production were to regulate the charge to the public in these cases of official publications, the prices of the maps of the Ordnance Survey, of the modern Domesday Book, and almost all Parliamentary proceedings would be prohibitive. It is to the interest of the country that uniform public documents should, as nearly as possible, be purchaseable at uniform prices. The Treasury and the Stationery Office should comply with the requirements of the public interest. The matter is well worthy of being inquired into by the new Controller of the Stationery Office. France has adopted a uniform price for the parts of its "Inventaire Général," and there can be no reason why England cannot do the same for the "Universal Art Inventory."

THE SUN'S PHOTOSPHERE.

BY J. NORMAN LOCKYER*

1. JANSEN has just made a communication to the French Academy of Sciences, which will be received with interest, not only by students of solar physics, but by all who follow the various triumphs achieved by modern scientific methods. It seems a paradox that discoveries can be made depending on the appearance of the sun's surface by observations in which the eye applied to the telescope is powerless; but this the statement made by Dr. Jansen himself, and there is little doubt that he has proved his point.

Before we come to the discovery itself let us say a little concerning Dr. Jansen's recent endeavours. Among the large telescopes which now form a part of the equipment of the new physical observatory recently established by the French Government at Meudon, in the grounds of a princely Chateau, there is one to which Dr. Jansen has recently almost exclusively confined his attention. It is a photoheliograph giving images of the sun on an enormous scale—compared with which the pictures obtained by the new photoheliograph are, so to speak, pigmies, while the perfection of the image and the photographic processes employed are so exquisite, that the finest mottling on the sun's surface cannot be overlooked by those even who are profoundly ignorant of the interest which attaches to it.

This perfection and size of image have been obtained by Dr. Jansen by combining all that is best in the principles utilized in one direction by Mr. De la Rue, and in the other by Mr. Rutherford. In the Kew photoheliograph, which has done such noble work in its day that it will be regarded with the utmost veneration in the future, we have first a small object-glass corrected after the manner of photographic lenses, so as to make the so-called actinic and the visual rays coincide, and then the image formed by this lens is enlarged by a secondary magnifier constructed, though perhaps not too accurately, so as to make the actinic and visual rays unite in a second image on a prepared plate. Mr. Rutherford's beautiful photographs of the sun were obtained in a somewhat different manner. In his object-glass he discarded the visual rays altogether, and brought only the blue rays to a focus; but when enlargements were made, an ordinary photographic lens—that is, one in which the blue and yellow rays are made to coincide—was used.

Dr. Jansen uses a secondary magnifier, but with the assistance of M. Pragmowski he has taken care that both it and the object-glass are effective only for those rays which are most strongly photographic. Nor is this all; he has not feared largely to increase the apertures and focal length, so that the total length of the Kew instrument is less than one-third of that in operation in Paris.

The largely-increased aperture which Dr. Jansen has given to his instrument is a point of great importance. In the early days of solar photography the aperture used was small, in order to prevent over-exposure. It was soon found that this small aperture, as was to be expected, produced poor images in consequence of the diffraction effects brought about by it. It then became a question of increasing the aperture while the exposure was reduced, and many forms of instantaneous shutters have been suggested with this end in view. With these, if a spring be used, the narrow slit which flashes across the beam to pay the light out into the plate changes its velocity during its passage as the tension of the spring changes. Of this again Dr. Jansen has not been unmindful, and he has invented a contrivance in which the velocity is constant during the whole length of run of the shutter.

By these various arrangements the plates have now been

* *Nature*.
† I have recently been making some experiments with a view of getting rid of the narrow aperture in general use, as it has appeared to me that the diffraction effects produced by it must be as injurious to definition as those due to a small object-glass. I have found that a circular aperture, allowing the whole beam to be flashed on the plate in conjunction with a plate of optically pure yellow glass nearly in contact with the photographic plate can be used without over-exposure.

produced at Meudon of fifteen inches diameter, showing details on the sun's surface of less than one second of arc.

So much for the *modus operandi*. Now for the branch of solar work which has been advanced.

It is more than fifteen years ago since the question of the minute structure of the solar photosphere was one of the questions of the day. The so-called "mottling" had long been observed. The keen-eyed Dawes had pointed out the thatch-like formation of the penumbra of spots, when one day Mr. Neumayer announced the discovery that the whole sun was covered with objects resembling willow leaves, most strangely and effectively interlaced. I here quote from Sir John Herschel.

"According to his observations, made with a very fine telescope of his own making, the bright surface of the sun consists of separate, insulated, individual objects or things, all nearly or exactly of one certain definite size and shape, which is more like that of a willow leaf, as he describes them, than anything else. These leaves or scales are not arranged in any order (as those on a butterfly's wing are), but lie crossing one another in all directions, like what are called spills in the game of spillikins; except at the borders of a spot, where they point for the most part inwards, towards the middle of the spot, presenting much the sort of appearance that the small leaves of some water-plants or seaweeds do at the edge of a deep hole or clear water. The exceedingly definite shape of these objects; their exact similarity one to another; and the way in which they lie across and athwart each other (except when they form a sort of bridge across a spot, in which case they seem to affect a common direction, that, namely, of the bridge itself), all these characters seem quite repugnant to the notion of their being of a vaporous, a cloudy, or of a fluid nature. Nothing remains but to consider them as separate and independent sheets, flakes, or scales, having some sort of solidity. And these flakes, be they what they may, and whatever may be said about the dashing of meteoric stones into the sun's atmosphere, &c., are evidently the immediate sources of the solar light and heat, by whatever mechanism or whatever processes they may be enabled to develop, and as it were elaborate these elements from the bosom of the non-luminous fluid in which they appear to float. Looked at in this point of view, we cannot refuse to regard them as organisms of some peculiar and amazing kind . . ."

Here, then, was a discovery with a vengeance! and absolute endorsement from the man above all others who had a right to express an opinion. Nevertheless, the organisms have since disappeared, and the work of many careful observers has established that the mottling on the sun's surface is due to dome-like masses, and that the "thatch" of the penumbra is due to these dome-like masses being drawn, either directly or in the manner of a cyclone, towards the centre of the spot. In fact the "pores" in the interval between the domes are so many small spots, while the faculae are the higher levels of the cloudy surface. The fact that faculae are so much better seen near the limb proves that the absorption of the solar atmosphere rapidly changes between the levels reached by the upper faculae and the pores.

These masses are in all probability due to a rapid increase of pressure in the portion of the solar atmosphere occupied by the photosphere; we know, or think we know, that they are not due to reduction of temperature.

Thus much presumed, we now come to Dr. Jansen's discovery.

An attentive examination of his photographs shows that the surface of the photosphere has not a constitution uniform in all its parts, but that it is divided into a series of figures more or less distant from each other, and presenting a peculiar constitution. These figures have contours more or less rounded, often very rectilinear, and generally resembling polygons. The dimensions of these figures are

